44787

National Library of Canada
Bibliothèque nationale du Canada

Canadian Theses Division
Division des thèses canadiennes

Ottawa, Canada
K1A 0N4

PERMISSION TO MICROFILM — AUTORISATION DE MICROFILMER

• Please print or type — Écrire en lettres moulées ou dactylographier

Full Name of Author — Nom complet de l'auteur

TREVOR WILLIAM MURRAY

Date of Birth — Date de naissance

30/10/46

Country of Birth — Lieu de naissance

TRINIDAD & TOBAGO

Permanent Address — Résidence fixe

Dept of Rural Economy
UNIVERSITY OF ALBERTA.
ALBERTA.

Title of Thesis — Titre de la thèse

AN EMPIRICAL ANALYSIS OF SOME MAJOR IMPACTS OF PROTECTIONISM IN THE INTERNATIONAL TRADE IN SUGAR

University — Université

UNIVERSITY OF ALBERTA

Degree for which thesis was presented — Grade pour lequel cette thèse fut présentée

Master of Science

Year this degree conferred — Année d'obtention de ce grade

1980

Name of Supervisor — Nom du directeur de thèse

Michele Veeman

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE DU CANADA de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans l'autorisation écrite de l'auteur.

Date

18/4/80

Signature

T. Murray

NL-91 (4/77)

National Library of Canada
Collections Development Branch

Canadian Theses on
Microfiche Service

Bibliothèque nationale du Canada
Direction du développement des collections

Service des thèses canadiennes
sur microfiche

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE

Ottawa, Canada
K1A 0N4

NL-339 (Rev. 8/80)

THE UNIVERSITY OF ALBERTA

AN EMPIRICAL ANALYSIS OF SOME MAJOR IMPACTS OF PROTECTIONISM IN THE INTERNATIONAL TRADE IN SUGAR

by

© TREVOR WILLIAM MURRAY

University of Alberta

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

IN

AGRICULTURAL ECONOMICS

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA

SPRING, 1980

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled AN EMPIRICAL ANALYSIS OF SOME MAJOR IMPACTS OF PROTECTIONISM IN THE INTERNATIONAL TRADE IN SUGAR submitted by TREVOR WILLIAM MURRAY in partial fulfilment of the requirements for the degree of MASTER OF SCIENCE in AGRICULTURAL ECONOMICS.

Michele Veeman

Supervisor

M. L. Lee

John Dalhousie

Date April 11, 1980.

University of Alberta

ACKNOWLEDGEMENTS

This is a great pleasure for me to thank my thesis advisor Dr. M.M. Veeman to whom I owe tremendous gratitude. Her heuristic and perceptive approach to my education is responsible for much of my knowledge. Also, to my thesis committee members Dr. M.L. Lehrol, and Dr. J.J. Delehanty and professors who have made many helpful comments and suggestions, these were greatly appreciated.

My collegues, Mr. Jose Aggrey and Mr. John Reddon made many valid comments throughout the period of this research project. Their overall support must be commended. Special thanks must be given to the Librarians at the University of Alberta, especially those at the Department of Rural Economy. They were extremely helpful in obtaining adequate documentation. Also, special mention must be made of the secretarial staff and computer analyst in the Department of Rural Economy, who assisted in the preparation of the tables, figures, and graphs which appear in this study.

Finally, my deepest gratitude to my parents and my family who have given me invaluable support and patience throughout the years of my education, and without whom this project would not have been possible.

University of Alberta

ABSTRACT

Income and price instability in international sugar trade has traditionally been a common occurrence. For sugar producers, unstable prices mean unstable incomes and increased insecurity. Over time, many countries have devised trade policies to combat the negative influences of price movements on sugar producers' incomes. The policies evolved have been highly protective of many high cost domestic sugar producers against lower cost foreign sugar imports.

The present study examines some of the economic implications of protectionism by major sugar exporters and importers on international trade in sugar in 1959, 1974, and 1978. To accomplish this, the study updated and extended the 1959 study by R.H. Snape. Following Snape's procedure, the general indication of the effects of protectionism on production were derived from estimating relative price effects. The effects of protection on consumption and trade levels of sugar is then estimated. The results of this study indicate that if protectionism had been removed from international trade in sugar in 1978 there would have been a 1 to 4.2% increase in sugar consumption levels and therefore similar increases in sugar production and trade levels.

University of Alberta

TABLE OF CONTENTS

Page

RELEASE FORM.....i

TITLE PAGE.....ii

CERTIFICATE OF EXAMINATION.....iii

ACKNOWLEDGEMENTS.....iv

ABSTRACT.....v

TABLE OF CONTENTS.....vii

LIST OF TABLES.....xi

LIST OF FIGURES.....xii

CHAPTER 1 - INTRODUCTION.....1

Statement of the Problem.....1

The Objectives of the Study.....4

The Hypotheses.....5

The Methodology.....6

The Contents of the Other Chapters.....7

CHAPTER II - SUGAR AS AN INTERNATIONALLY TRADED AGRICULTURAL COMMODITY.....9

The Origins of Sugar.....9

The Development of Protective Barriers in the Trading of Sugar.....10

REVIEW OF INTERNATIONAL TRADE IN SUGAR: 0

World Production, Consumption and Stocks.....14

University of Alberta

TABLE OF CONTENTS

CONTINUED

Page

Major Cane Sugar Producers.....16

Major Beet Sugar Producers.....21

Major World Sugar Importers, Exporters and Consumers

THE OVERALL PATTERN OF WORLD TRADE: 1960 to 1978....32

CHAPTER III - REVIEW OF LITERATURE ON INTERNATIONAL SUGAR TRADE POLICIES.....36

Introduction.....36

Review of Selected Literature.....37

REVIEW OF THE THEORY OF TARIFF AND NON-TARIFF RESTRAINTS ON TRADE.....44

Tariffs.....44

Non-Tariff Measures.....49

A Variable Levy.....52

Deficiency Payments.....54

POLICIES OF THE MAJOR SUGAR TRADERS.....58

The United States.....58

The European Economic Community and Self-Sufficiency Australia, Brazil and Cuba.....66

MAJOR BILATERAL AND MULTILATERAL SUGAR AGREEMENTS...67

Bilateral Sugar Agreements.....67

University of Alberta

TABLE OF CONTENTS

CONTINUED

Page

Cuba and the USSR.....68

The US and Its Suppliers.....68

Multilateral Sugar Agreements.....70

CHAPTER IV - THE ANALYTICAL MODEL.....73

Introduction.....73

The Variables and The Data.....75

The World Price.....76

Import and Export Parity Prices.....77

The U.S. Price, New York basis.....77

Refining and Distribution Margin.....78

The Analytical Procedure.....79

Results of the Analysis.....86

Some Implications of the Results.....96

Limitations of the Study.....98

CHAPTER V - CONCLUSIONS AND RECOMMENDATIONS.....100

Conclusions.....100

Recommendations.....104

University of Alberta

TABLE OF CONTENTS

CONTINUED

Page

REFERENCES.....107

APPENDIX A1 - OTHER MAJOR INTERNATIONAL COMMODITY AGREEMENTS

The International Coffee Agreement.....116

The International Grains Agreement.....118

ECONOMIC IMPLICATIONS OF COMMODITY AGREEMENTS....120

APPENDIX B1 - CALCULATION OF WEIGHTED AVERAGE PRICES.....124

University of Alberta

LEAF X OMITTED IN PAGE NUMBERING.

LIST OF TABLES

Table		Page
2.1	Cane Sugar Production of Major Producers 1960 to 1978	17
2.2	Beet Sugar Production of Major Producers 1960 to 1978	22
2.3	Gross Sugar Imports By Major Importers 1960 to 1978	25
2.4	Sugar Exports By Major Exporters 1960 to 1978	27
2.5	Annual Per Capita Consumption of Major Consumers 1960 to 1978	28
2.6	Annual Total Consumption of Major Consumers 1960 to 1978	29
4.1	Home Produced Raw Sugar 1959: Estimated Average Price	88
4.2	Home Produced Raw Sugar 1974 and 1978: Estimated Average Price	90
4.3	Calculation of Increased Consumption of Sugar with the Removal of Protection and Revenue Duties - 1959	92
4.4	Calculation of Increased Consumption of Sugar with the Removal of Protection and Revenue Duties - 1974	93
4.5	Calculation of Increased Consumption of Sugar with the Removal of Protection and Revenue Duties - 1978	95

LIST OF FIGURES

Figures		Page
2.1	Major Cane and Beet Sugar Producing Areas	11
2.2	World Sugar Production, Consumption, and Stocks	15
2.3	Average Annual Sugar Prices at Specified Markets	34
3.1	Partial Equilibrium Analysis of the Effects of a Tariff for an Importing Country	46
3.2	Partial Equilibrium Analysis of the Effects of a Quota for an Importing Country	51
3.3	The Effects of a Variable Levy to an Importing Country	53
3.4	The Effects of a Deficiency Payment in the Domestic Market	55
3.5	The Effects of a Deficiency Payment in both the World Market and the Domestic Market	57
3.6	The European Economic Community Sugar Price Determination Mechanism	64
3.7	The International Sugar Agreement Price Stabilization Mechanism	72

CHAPTER 1

INTRODUCTION

Statement of the Problem

Historically, the agriculture sector in most economies has been confronted with a host of economic problems. Two long standing features of the agriculture of developing countries have been the relatively low levels of incomes obtained by farmers in the long run, and the instability in prices which prevails in the short run. Simultaneously, low prices have given rise to low incomes.

The level of agricultural commodity prices is determined by the short run supply of, and demand for agricultural commodities. The supply and demand functions for sugar have traditionally been inelastic. This inelasticity developed as a result of the immobility of agriculture inputs on the one hand, and nature of consumers' tastes and preferences on the other. In such a situation, relatively small shifts in the supply of, or demand for agriculture commodities can cause relatively large oscillations in prices resulting in substantial price and income

University of Alberta

instability.[1]

A long run solution to the traditional problem of low agricultural incomes in developing countries would be to encourage movement of agricultural labour to higher income sectors of the economy. However, an underlying difficulty with this approach is that agricultural labour is not perfectly mobile. It does not respond adequately to the inducements of higher income sectors of the economy.[2]

Consequently, in attempting to solve the problem of low incomes in agriculture, price and income stabilization schemes have been devised. The technique of supply management in agriculture is one such scheme. It attempts to control production and marketing of the commodity by regulating the quantity supplied to consumers.

This type of intervention in the production and marketing of agricultural commodities for the purpose of stabilizing prices and incomes often also results in the regulation of international trade. Price maintenance attempts will be hampered if the domestic market is exposed to the fluctuations of international supply and demand.

Another technique commonly used in price and income support schemes is that of export subsidization for stimulating demand. This type of intervention also results

---

[1] R.M. French-Davis, "Export Quotas and Allocative Efficiency Under Market Instability", American Journal of Agricultural Economics, Vol. 50, No. 3, (August 1968).
[2] G.E. Brandow, "Policy for Commercial Agriculture, 1945-71", in Vol. 1, A Survey of Agricultural Economic Literature, ed. L.R. Martin, 3 Vols.; University of Minnesota Press, (Minneapolis: 1977), p. 215.

University of Alberta

in trade distortions. Whether there is open limitation of imports or subsidization of exports, competition in the domestic market will be affected by government policies devised to stabilize domestic prices and producers' incomes.

Sugar is one of the oldest and most widely traded agricultural commodities in the international market. More than half the total world trade in sugar is governed by special market arrangements which major consuming nations have with their respective suppliers. As a result of this, the free market is a residual market where the quantity of sugar entering this market is a relatively small portion of the total world trade in sugar.[1] The special arrangements which nations obtain in international sugar trade have a decisive influence on not only the direction of world trade, but also on the pattern of world sugar production.[2]

These special arrangements may have different stated objectives. However, there is an underlying common theme: they all seek to encourage self sufficency and both higher and stable prices in the long run thereby ensuring a more desirable level of income for sugar producers. In attempting to achieve long run price stability, imports have been directly limited either by quotas, tariffs, and variable levies or indirectly by subsidizing domestic sugar production. Variable levies and quotas may be effective in

---

[1] R.H. Snape, "Some Effects of Protection in the World Sugar Industry", Economica, Vol. 30, (February 1963).
[2] D.C. Horton, "Policy Directions for the United States Sugar Program." American Journal of Agricultural Economics, Vol. 52, (1970).

University of Alberta

achieving short run price stability. However, they lead to higher prices for consumers. Furthermore, these policies distort international trade.[1]

Sugar is one of the most protected agricultural commodities in international trade. The protection in most cases has been concentrated in developed countries who have a comparative disadvantage in the production of sugar.[2] The structure of sugar protection on raw and refined sugar in many developed countries effectively deters those developing countries who have a comparative advantage in sugar production from the refining process.[3]

The Objectives of the Study

The purpose of this study is to evaluate some of the major impacts of protectionism in the international trade in sugar during 1959, 1974, and 1978. The policies of some major sugar consuming and producing nations have been identified and evaluated. In evaluating these policies, estimates of some of the major impacts of these policies on world sugar consumption and production patterns were made.

---

[1] G. Gemmill, "An Equilibrum Analysis of US Sugar Policy", American Journal of Agricultural Economics, Vol. 59, No. 4, (November 1977).
[2] H.G. Johnson, "Sugar Protection and the Export Earnings of Less Developed Countries: Variations on a Theme by R.H. Snape", Economica, Vol. 33, (February 1966).
[3] H.C. Horton, op. cit.

University of Alberta

The Hypotheses

The hypotheses tested are that:

1. Sugar production in and export from major exporting nations is reduced by protective policies in major importing nations.
2. Sugar consumption in major importing nations would increase in the absence of protection of their local sugar industry.
3. The level of world trade in sugar that could be expected in the absence of protection would exceed the levels applying under protection.

University of Alberta

The Methodology

The methodology which is used in this analysis was adopted from an earlier study done by Snape.[1] This methodology is more fully outlined in Chapter IV. In testing the above hypotheses price and consumption effects of protectionism were estimated. In obtaining a general indication of the "production effects" in protecting countries, estimates of the extent to which sugar prices were increased in selected major sugar protecting and consuming nations were made for 1959, 1974, and 1978.

In estimating the "consumption effects" of international sugar protection, estimates of the additional sugar consumption which would have occurred in major importing countries in the absence of any protection in international sugar trade were made. These estimates were then compared with the actual consumption which occurred in 1959, 1974, and 1978.

To estimate the consumption effects, "import and export parity prices" were calculated based on data on production costs in the sugar exporting countries, together with an estimated price elasticity of demand to determine the additional quantity of sugar which would have been consumed in the absence of any protection in the international trade in sugar. These "parity prices" were then compared with the price paid by consumers in the protected countries in 1959,

---

[1] R.H. Snape, op. cit.

University of Alberta

1974, and 1978, and estimates of the world price which they would have paid in the absence of any protection in the world sugar economy for the years specified.

The Contents of the Other Chapters

In Chapter II a short discourse on the historical development of protective barriers in world sugar trade is given. Trends in sugar production of the major sugar producers, and exporters for the period 1960 to 1978 are presented. Also the trends in international sugar trade for the specified years are observed and discussed.

In Chapter III, a review of literature assessing the effects of trade specifically with trade policies on the international sugar market is undertaken. A discussion of the trade policies of major consuming, importing, producing, and exporting countries follows. Also, an analysis of the major bilateral and multilateral trade arrangements in international sugar trade is presented. Comparisons are then made between these arrangements and those for other major internationally traded agriculture commodities.

Chapter IV deals with the analytical framework used in the study. It contains a discussion of the model which is used in the study and outlines the available data and their manipulations. The results of the analysis are presented.

Chapter V concludes the study by discussing the results obtained. Some of the major policy implications and

University of Alberta

limitations of the analysis are discussed and recommendations are presented. Suggestions are made for the development of trade policy instruments in international trade in sugar.

University of Alberta

CHAPTER II

SUGAR AS AN INTERNATIONALLY TRADED AGRICULTURAL COMMODITY

The Origins of Sugar

The origins and the development of the sugar cane, Saccharum Officinarum L, from which sugar is manufactured have been as controversial and varied as have the many agreements which affect its present trading patterns. The debate as to exactly where, when, and how the sugar cane originated has been extensive.

Deerr[1] contends that the sugar cane is indigenous to the South Pacific through a highly specialized symbiotic relationship between a plant, the sugar cane; a pest, the beetle borer; and a parasite, the tachinid fly. Chaturvedi[2] asserts that India is the home of the sugar cane, basing his assertions on recorded ancient Hindu mythology. Initally, a crude form of sugar -- molasses-- was made through crushing the cane and boiling the recovered juices. This commodity was considered to be a highly superior good, primarily because of its valuable medicinal properties and high cost in acquiring it. Although there may be disagreement about the origins of the sugar cane it is generally agreed that

---

[1] N.A. Deerr, A History of Sugar, (2 Vols.; London: Chapman and Hall, 1948), 2, p.13.
[2] H.S. Chaturvedi, "The Sugar Industry of India", The Sugar Journal, Vol., XIII (London: 1951).

University of Alberta

the sugar cane is best grown in tropical and sub-tropical regions as is shown in Figure 2.1.

The Development of Protective Barriers in the Trading of Sugar

Aside from precious metals, sugar was the first commodity to be shipped commercially to European countries from their colonies in the new world.[1] Disputes among European nations for control of the sugar lands and seas around the colonies became prevalent.

From the earliest days of colonial expansion, the mother countries regarded trade with their colonies as exclusive to themselves. As a result, a system of restricted trade among the colonialists gradually evolved. France implemented a code in 1627 known as the Pacte Colonial. This law forbade all French traders to ship or to procure any product of the colonies including sugar without the authority of the state.[2]

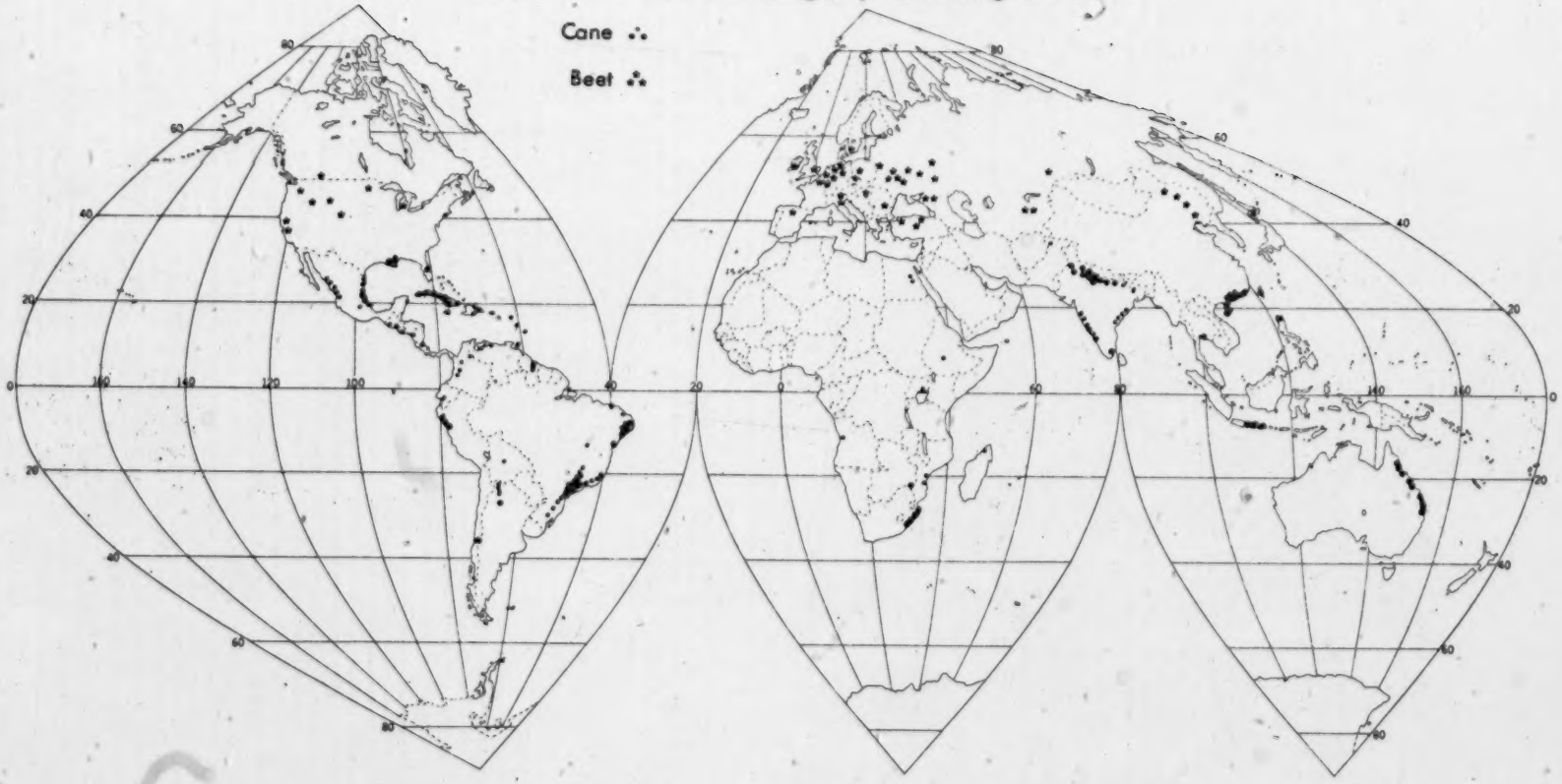
The original English Navigation Act which was passed in 1650 and revised in 1651 demanded that all goods from Asia, Africa and America be shipped only in English, Irish, or colonial vessels. The Commonwealth Act of 1651 specified that certain commodities including sugar were only to be shipped to England or colonial ports. The Staple Act of 1663

---

[1] R.A. Ballinger, A History of Sugar Marketing, U.S. Department of Agriculture, Economic Research Service, Report No. 197, (Washington: 1971).
[2] N.A. Deerr, op. cit, p. 408.

University of Alberta

Figure 2.1
Major cane and beet sugar producing areas



SOURCE: Oxford Economic Atlas of the World, 4th ed., Oxford University Press, (Oxford: 1972), p. 14.

prohibited all goods from being shipped to the colonies except through England where they were to be unloaded, duties paid and then reshipped. The Plantation Act of 1673 demanded that all goods shipped from one colony to another pay the same duties that would have been paid on entry to England. There was also the Molasses Act of 1733, which imposed duties on all foreign sugar, rum, and molasses which entered into British colonies.[1]

The beet sugar industry in Europe grew largely as a result of sugar shortages which existed at the time of the Napoleonic war.[2] However, Germany's beet sugar industry developed slightly differently. In 1885 a fixed tax was levied on beet sugar production and a refund was allowed on exported sugar. The tax was levied based on a specific percentage of a required production yield. The refund was made on exported sugar which had production yields greater than the stipulated amount.[3] This impost was an incentive to producers and manufacturers to increase beet sugar production. In a similar manner Austria, Belgium, Holland, and Russia also encouraged the production of beet sugar.

In 1822, a movement began in England to remove sugar trade restrictions. In that year two acts were passed: The West Indian and American Trade Bill and the Colonial Trade Act. The first permitted the importation of products from

---

[1] Ibid., pp. 408-422.
[2] U.N. The International Sugar Organization, The World Sugar Economy, Structure, and Policies - The World Picture, International Sugar Bulletin, Vol. 2, (New York: 1963).
[3] N.A. Deerr, op. cit. pp. 502-503.

University of Alberta

foreign countries into specified ports only in British ships or those of the country of origin on payment of a 10% ad-valorem tax. The second act reinstated the Molasses Act which had been suspended in 1792. It allowed imports of any produce of colonies into Europe and Africa in British ships.[1]

In 1901 at the Brussels' Convention an agreement was reached to terminate all direct and indirect bounties in international trade of sugar. The bounty had been a refund or "drawback" on duties paid on imported raw sugar by domestic refiners. This refund was calculated based on the yield manufacturers obtained in converting raw sugar to refined sugar. Manufacturers obtaining yields above and beyond the required level were rewarded through deductions on import duties.[2] In 1907 when the Brussel's Convention came up for renewal the manufacturers of sugar products such as confectionary, jams, and jellies were dissatisfied with the effects of the agreement on their trade and opposed its continuation. Under the bounty system, manufacturers had obtained lower priced sugar because refiners were able to sell sugar at the domestic price minus the refunds on import duties. With the removal of the bounties, refined sugar prices were increased by the level of the additional import duties. While the bounty system differed in detail from country to country, the basic principle involved was identical. The objective was to stimulate beet sugar

---

[1] Ibid., p. 422.
[2] Ibid., p. 501.

University of Alberta

production by making special payments to domestic sugar producers and refiners.[1]

REVIEW OF INTERNATIONAL TRADE IN SUGAR: 1960 TO 1978

World Production, Consumption and Stocks

During 1960 to 1978 there has been a steady increase in world centrifugal[2] sugar production. Total world centrifugal sugar production was 51.5 million metric tons in 1960. Of this amount, cane and beet sugar accounted for an approximate share of 56.6% and 43.4% respectively. In 1978 world centrifugal sugar output was approximately 90 million metric tons. Beet sugar production represented 38.8% of total centrifugal sugar output while cane sugar production accounted for 61.2%. These trends are shown in Figure 2.2. Generally, world cane sugar production has increased during the period 1960 to 1978 even though there has been some fluctuations. Cane sugar production has increased its share of world sugar supply by approximately 4.6% since 1960. Beet sugar production has tended to increase less rapidly since

---

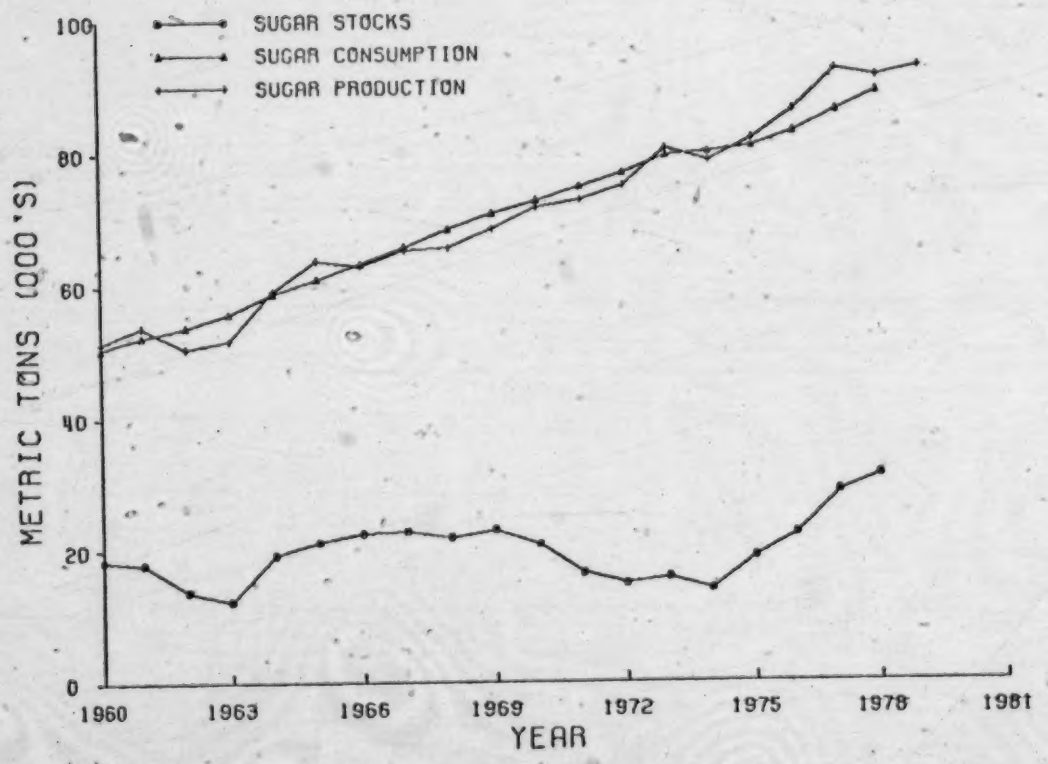
[1] Ibid., p. 504.

[2] Non-centrifugal sugar includes those sugars which are not produced by the extraction of the solid forms or objects from boiled sugar juices. Not included are gur, jaggery, muscovado, papelon, and panela.

University of Alberta

FIGURE 2.2

WORLD SUGAR PRODUCTION, CONSUMPTION AND STOCKS (RAW SUGAR)



DATA SOURCE: International Sugar Organization, Sugar Year Book, (London), Various Issues,

1960 and its total share of the world centrifugal sugar supply has declined by approximately 4.6%.

Between 1960 and 1978, total world centrifugal sugar consumption gradually increased from 51.1 million metric tons in 1960 to 90 million metric tons in 1978 -- an average annual increase of approximately 5.5%. Between 1963 and 1969 there was an increase in world sugar stocks. From 1970 to 1974 this pattern changed somewhat when sugar stocks were decreased. From 1974 to 1978 world sugar stocks have been increasing steadily. World sugar consumption between 1960 and 1978 reflected not only increasing world population growth, but also rising per capita incomes in some developing countries who traditionally had been consuming sugar at a low level.[1]

University of Alberta

Major Cane Sugar Producers

The largest cane sugar producer over the last twenty years has been Cuba. Cuba's sugar production, however, has been relatively unstable from year to year as is shown in Table 2.1. For example, Cuban sugar production declined from approximately 6.8 million metric tons in 1961 to 5.8 million metric tons in 1962 to 4.2 million metric tons in 1963. By 1970 it had increased to 9.4 million metric tons but declined again in 1972 to 4.8 million metric tons.

---

[1] U.N., Food and Agricultural Organization, FAO Commodity Review and Outlook: 1977-79, (Rome: 1978), p. 20.

TABLE 2.1

CANE SUGAR PRODUCTION BY MAJOR PRODUCERS 1960 TO 1978
Thousands of Metric Tons

Year	CUBA	BRAZIL	AUSTRALIA	PHILIPPINES	INDIA	DOMINICAN REPUBLIC	USA	WORLD TOTAL
1960	5862	3263	1308	1387	2675	1094	559	28996
1961	6767	3454	1405	1317	3288	1116	572	30994
1962	5808	3934	1512	1618	3693	852	858	29456
1963	4211	3576	2000	1714	2979	864	853	29900
1964	4400	3620	1883	1856	3470	838	1184	32343
1965	6600	4152	2132	1767	4285	574	1147	36957
1966	4950	5324	2187	1590	4514	680	1104	35809
1967	6200	4807	2564	1718	3039	813	1215	37129
1968	5500	4922	2686	1759	3092	655	1457	36752
1969	5200	4804	3052	1760	4640	872	1214	38115
1970	9406	5063	2440	2124	5523	998	1071	42852
1971	6530	5642	2702	2270	4962	1115	1253	42279
1972	4837	5939	3015	2062	4222	1109	1206	40830
1973	5787	6795	3016	2673	5040	1045	1620	45090
1974	5800	6959	2592	2643	4949	1111	1253	47841
1975	6300	7400	2927	2466	5794	1135	1334	49858
1976	6200	6200	2988	2875	5464	1249	1657	53610
1977	6100	7500	3405	2750	6043	1222	1519	54778
1978	7100	8600	3322	2397	7720	1179	1497	52500

SOURCE: U.S. Department of Agriculture, Agriculture Statistics,(Washington). Various Issues, U.N. Food and Agriculture Organization, Production Yearbook,(Rome). Various Issues, U.S. Department of Agriculture, Foreign Agriculture Circular, FS3-77 (Washington, August 1977).

Weather is a significant factor in the production and supply of sugar. Cuba's sugar production has been affected over the years by changing weather conditions. Other major factors which have also affected Cuban sugar production during the last twenty years were: the embargo placed on Cuban sugar exported to the United States; the shortage of skilled labour for cane cultivation and harvesting; a deterioration of equipment; together with attempts at diversification of cane acreage to other crops.[1]

Another large producer of cane sugar is Brazil. Brazil has been rapidly increasing its output and has been the largest national producer of cane sugar for the last three years. An exception is 1976, when there was a noticeable decrease in sugar production from 7.4 million metric tons in 1975 to 6.2 million metric tons in the following year. Unfavourable weather conditions during 1976 were the major reasons cited for this decline.[2] Presently, the Brazilian government is involved in a program which includes incentives for producers to expand sugar production. The objective of this program is to obtain 20% of national energy requirements from alcohol in

---

[1] The Commonwealth Secretariat, Plantation Crops - A Review, (London: 1973), p. 128.
[2] U.N., Food and Agriculture Organization, FAO Commodity Review and Outlook: 1977-79, (Rome: 1978), p.19-22.

University of Alberta

1980.[1] [2] [3]

The third major producer of cane sugar is India. India's sugar production has also tended to be relatively unstable. This can be partly explained by periodically unfavourable weather conditions. The major source of this instability is the non-centrifugal sector of the industry which produces gur (jaggery), and Khandsari. This sector accounts for about two-thirds of the cane crushed. It has been alleged that government policies of controlling the price paid by centrifugal units (i.e. by factories) and not those prices paid by the gur and khandsari units has had destabilizing effects on the centrifugal sugar portion of the industry.[4] As a result, farmers have tended to supply their cane to the non-centrifugal units rather than to the factories. As an example of this instability, when in 1967/68 the government partially de-controlled the market temporarily, centrifugal sugar factories were able to offer higher prices and bid more successfully for cane supplies. Cane sugar production increased from approximately 3 million metric tons in 1967 and 1968 to 4.6 and 5.5 million metric tons in

University of Alberta

---

[1] U.S., Department of Agriculture, Foreign Agriculture Circular, FS-3-78, (Washington: December 1978).
[2] The Globe and Mail, June 16, 1979,
[3] The Wall Street Journal, December 7, 1976.
[4] The Commonwealth Secretariat, Plantation Crops - A Review, (London: 1973), p. 121.

1969 and 1970 respectively.[1]

Australia is another major cane sugar producer. Generally, Australia's sugar production has increased steadily although the industry has experienced some fluctuations. Most of the instability has been attributable to periodic unfavourable weather conditions which have been reflected in small yields and low sucrose content.[2]

In reviewing the Australian sugar industry it is important to point out that increases in sugar production were a significant factor in the industry's rapid development. The increased productivity of the industry is attributable in part to major technological advances. The ensuing increase in output enabled the industry to absorb increases in production costs especially wages.[3]

The importance of the Philippines as a major international cane sugar producer is in its role as an alternative supplier to the United States market replacing Cuban sugar. In 1960, sugar production was 1.3 million metric tons. By 1978, cane sugar production had increased to 2.3 million metric tons. Over the period from 1960 to 1978 there was 5.2% average annual increase in production. This increase in production can be attributed to expansion programs whose objectives were to satisfy the additional demand of the United States sugar market as a result of the embargo imposed on Cuban sugar

---

[1] Ibid.
[2] Ibid., p. 123.
[3] Ibid.

University of Alberta

supplies.[1]

Major Beet Sugar Producers

As is shown in Table 2.2, the world's largest beet sugar producer is the USSR. In 1960, USSR beet sugar production was approximately 6 million metric tons. In 1978, production had increased to 8.8 million metric tons. Fluctuations in USSR beet sugar production have been frequent during the period from 1960 to 1978. These variations have been mainly due to periodic unfavourable weather conditions throughout Europe especially in 1971 and 1972.[2]During 1974 to 1976 USSR sugar production was affected by transportation and post harvest difficulties.[3]

Beet sugar production in the United States showed an increasing trend between 1960 and 1978 despite weather induced fluctuations. The government's sugar policy of ensuring "favourable prices" for domestic sugar producers has also affected sugar production

University of Alberta

---

[1] Ibid., p. 129.
[2] U.S., Department of Agriculture, Report on World Sugar Supply and Demand 1980 and 1985, Foreign Agriculture Service, (Washington: November 1977), pp. 203-205.
[3] U.S., Department of Agriculture, Foreign Agriculture Circular, FS1-79, (Washington: May 1979), p. 4.

TABLE 2.2

BEET SUGAR PRODUCTION BY MAJOR PRODUCERS 1960 TO 1978
Thousands of Metric Tons

Year	USSR	USA	POLAND	FRANCE	WEST GERMANY	ITALY	UK	WORLD TOTAL
1960	5967	2123	974	1054	1389	1406	856	22477
1961	5717	2223	1500	2727	1956	996	982	22855
1962	6652	2181	1639	1704	1439	975	840	21211
1963	6522	2357	1329	1628	1488	997	757	21854
1964	6016	2812	1424	2010	2062	917	816	26919
1965	9547	2717	1514	2339	1576	1221	958	26897
1966	8877	2529	1673	1827	1887	1325	921	27238
1967	9660	2437	1833	1707	2017	1652	961	28188
1968	9660	2714	1823	2264	1943	1270	922	29016
1969	9920	2898	1696	2747	2096	1385	991	30388
1970	8708	3135	1518	2672	2019	1406	911	28816
1971	8209	3063	1733	2603	2036	1209	1038	30553
1972	8150	3624	1829	2984	2214	1253	1030	30722
1973	9570	3200	1817	3167	2504	1157	1048	32586
1974	7730	2727	1557	2948	2438	1010	618	28957
1975	7700	3659	1950	3231	2533	1457	697	32243
1976	7350	3522	2000	2968	2734	1750	773	33656
1977	9300	3000	2200	3913	2740	1190	1000	35878
1978	8825	2844	1851	4293	3075	1364	1003	35600

SOURCE: U.S. Department of Agriculture, Agriculture Statistics, (Washington), Various Issues.
U.N. Food and Agriculture Organization, Production Yearbook, (Rome), Various Issues.
U.S. Department of Agriculture, Foreign Agriculture Circular, FS3-77, (Washington: August 1977).

through production quotas.[1]

The European Economic Community (EEC) is another major beet sugar producer. There are difficulties, however, in analysing the beet sugar production of the EEC as one unit. For example, the United Kingdom, a major producer within the community, was not a member of the EEC from 1960 to 1972. As a result, data obtained for the aggregate EEC beet sugar production during that period does not include the United Kingdom. In overcoming this difficulty, trends in production data of the major beet sugar producing members within the EEC were analyzed individually.

France is the largest beet sugar producer in the community. Although beet sugar production in France increased steadily between 1961 and 1978, there have been fluctuations in production levels from year to year. These fluctuations, especially those within the last ten years (1968 to 1978), have been mainly attributed to the policies of the French government and also by that country's affiliations to the EEC.[2]

West Germany is another major beet sugar producer in the EEC. From 1960 to 1970, beet sugar production increased marginally from 1.3 million metric tons to 2 million metric tons. Between 1970 and 1978, production increased further to 3 million metric tons. West Germany's beet sugar industry

---

[1] R. Bohall, et al., The Sugar Industry's Structure, Pricing and Performance, U.S. Department of Agriculture, Agriculture Economic Report, No. 363, (Washington: March 1977), p. 31.
[2] U.S., Department of Agriculture, Report on World Sugar Supply and Demand 1980 and 1985, Foreign Agriculture Service, (Washington: November 1977), pp. 24-25.

University of Alberta

has also experienced some instability due to changing weather conditions which affected yields and the sucrose content of beet roots. Added to this are the influences of the sugar policies of the EEC. These policies are designed to affect sugar production and price levels among member states so as to ensure "favourable prices" for sugar producers and secure supplies within the community.[1]

Major World Sugar Importers, Exporters and Consumers

The United States has been a major importer of centrifugal sugar from 1960 to 1978 as is shown in Table 2.3. In 1960, total world exports of centrifugal sugar were 17 million metric tons. The United States imported approximately 4.7 million metric tons of that total. In 1978, total world exports of centrifugal sugar were about 31 million metric tons. Imports into the United States remained relatively stable and at approximately 4 million metric tons represented 12.9% of world trade. Except in 1965 and 1978 when imports decreased approximately 11.6% and 30.7% from 1964 and 1977 respectively, the United States' imports of centrifugal sugar have been relatively stable, fluctuating slightly around the annual average level of approximately 4 million metric tons.

Most of the United States' imports prior to 1960 came from Cuba, traditionally the world's largest exporter of

---

[1] Ibid., p. 133.

University of Alberta

Table 2.3

GROSS SUGAR SUGAR IMPORTS BY MAJOR IMPORTERS 1960 TO 1978
Thousands of Metric Tons

Year	USA	USSR	FRANCE	UK	JAPAN	CANADA	WORLD TOTAL
1960	4717	1893	856	2560	1379	680	17131
1961	4226	3965	432	2582	1508	760	19386
1962	4671	2740	474	2414	1651	832	19494
1963	4486	1255	425	2817	1628	830	18781
1964	4323	2082	489	2835	1285	717	18926
1965	3856	2528	480	2398	1902	924	18252
1966	4239	2032	561	2455	1917	862	19549
1967	4687	2737	539	2357	2002	984	21013
1968	4989	1935	415	2287	2264	951	21211
1969	4324	1335	330	2149	2225	947	20650
1970	4746	3005	61	2111	2600	950	23042
1971	4821	1536	112	2134	2427	899	22457
1972	4792	1924	128	2163	2777	908	22789
1973	4781	2631	100	2050	2372	965	24215
1974	5238	1856	158	2269	2771	901	23659
1975	5490	3237	183	2346	2473	998	22795
1976	4136	3760	136	2101	2439	875	23039
1977	5290	4776	110	1870	2708	1064	23481
1978	4080	4818	126	1881	3001	1091	24021

SOURCE: U.N. Food and Agriculture Organization, Trade Yearbook, (Rome), Various Issues.

centrifugal sugar. Table 2.4 demonstrates market shares of the major sugar exporters. World sugar production increased from 1960 to 1978 but world sugar exports have not maintained the same rate of increase over the same period.

The United States is also a major consumer of centrifugal sugar as is demonstrated in Tables 2.5 and 2.6. In 1960, total consumption of sugar in the United States was 8.6 million metric tons or 17.9% of total world sugar consumption of 47.8 million metric tons. The average per capita consumption of sugar in the United States in 1960 was 94.3 lbs. In the same year, the average world per capita consumption level was approximately 35.2 lbs. In 1978, total world consumption was 87.9 million metric tons. World average per capita consumption was 45.6 lbs. Average per capita consumption in the United States for 1978 was 96.1 lbs. Total consumption in the United States was 9.9 million metric tons or 11.2% of total world consumption for 1978. Except in 1975 when average per capita consumption decreased marginally to 90.2 lbs (from 96.6 lbs in 1974), average per capita consumption in the United States increased steadily over the period from 1960 to 1978. Total consumption of sugar in the United States has also increased steadily except for 1975 when total consumption decreased marginally from 10.8 million metric tons to 9.1 million metric tons.

The apparent stability which the United States' sugar imports and consumption have exhibited over the last twenty years can be attributed in part to the policies of the

University of Alberta

TABLE 2.4

SUGAR EXPORTS BY MAJOR EXPORTERS 1960 TO 1978
Thousands of Metric Tons

Year	CUBA	BRAZIL	AUSTRALIA	PHILIPPINES	INDIA	USSR	FRANCE	DOMINICAN REPUBLIC	WORLD TOTAL
1960	6211	942	869	1164	21	260	767	1208	17191
1961	7064	863	906	1153	326	936	978	825	19824
1962	5656	491	1287	1082	420	886	761	890	18679
1963	3881	581	1263	1195	563	745	964	719	17023
1964	4603	279	1384	1279	302	689	727	717	17660
1965	5859	841	1317	1195	298	719	1093	519	19982
1966	4888	1108	1896	1106	488	1282	859	604	18970
1967	6264	1103	1836	1040	196	1324	519	713	20527
1968	5059	1131	1790	1124	181	1438	791	692	21019
1969	4799	1099	2064	772	106	1366	643	618	20120
1970	6906	1126	1389	1237	358	1494	1033	793	22406
1971	5511	1191	1606	1422	323	1379	1166	994	21801
1972	4140	2054	2010	1240	105	64	1425	1099	21356
1973	4797	2820	2086	1474	259	46	1653	1031	22390
1974	5491	2357	1759	1542	737	103	1202	1055	22200
1975	5744	1515	1998	972	1291	59	994	950	22448
1976	5764	1253	2015	1456	915	61	1011	977	23012
1977	6238	2487	2530	2411	255	72	1213	1082	23651
1978	6152	2398	2611	2382	241	68	1153	1096	24001

SOURCE: U.S. Department of Agriculture, Agriculture Statistics, (Washington), Various Issues.
U.N. Food and Agriculture Organization, Trade Yearbook, (Rome), Various Issues.

TABLE 2.5

ANNUAL PER CAPITA CONSUMPTION OF MAJOR CONSUMERS 1960 TO 1978
Pounds per Head

Year	BRAZIL	USA	USSR	AUSTR.	CUBA	U.K.	DOMINICAN REPUBLIC	INDIA	JAPAN	CANADA	EEC	FRANCE	WORLD TOTAL
1960	79.0	94.3	80.3	134.4	139.0	121.4	75.0	13.0	40.0	106.0	--	64.6	35.2
1961	85.8	95.1	83.6	110.2	132.0	114.4	69.0	12.3	35.4	99.0	--	66.2	35.4
1962	88.0	96.7	84.0	115.5	132.0	119.0	73.2	12.7	36.9	97.0	--	70.4	36.0
1963	77.6	97.3	86.4	137.5	142.5	121.4	76.6	12.7	38.2	95.4	--	69.0	37.1
1964	75.0	96.8	80.0	138.6	142.0	121.8	70.6	12.9	37.6	92.8	--	73.7	38.0
1965	66.2	97.0	92.6	132.0	152.0	123.4	62.6	13.4	40.7	99.0	--	75.2	39.3
1966	71.6	97.3	96.3	128.9	172.4	115.7	66.4	13.8	44.0	101.6	--	78.7	40.9
1967	74.3	98.5	100.9	126.9	180.1	114.1	62.0	11.0	48.4	110.2	--	81.8	41.5
1968	88.2	99.2	106.3	123.2	173.1	115.0	68.2	10.1	52.0	101.6	--	84.2	43.3
1969	89.3	101.0	95.3	122.3	159.2	116.0	70.6	9.2	56.3	103.6	82.5	84.7	43.7
1970	82.3	101.8	99.0	123.2	114.4	116.0	67.3	15.2	64.0	110.4	84.5	--	43.7
1971	93.0	102.4	95.7	122.3	126.2	115.1	85.1	14.8	67.0	121.0	85.0	--	44.6
1972	94.0	102.8	95.5	121.7	119.0	115.0	83.0	14.3	66.2	96.4	90.0	--	44.8
1973	100.0	101.5	98.6	127.2	125.0	--	78.0	14.3	67.0	100.3	96.0	--	45.5
1974	102.0	96.6	97.7	126.1	119.0	--	72.0	15.0	67.0	92.0	99.2	--	45.5
1975	100.0	90.2	98.0	127.0	124.5	--	78.0	14.0	55.4	100.3	80.1	--	43.1
1976	101.6	94.7	102.9	126.0	123.7	--	71.9	14.5	61.3	91.7	91.5	--	44.8
1977	101.1	95.7	102.1	125.7	123.1	--	72.1	14.1	62.1	92.1	91.3	--	45.8
1978	100.2	96.1	103.2	124.8	125.1	--	71.9	15.2	63.2	93.2	91.1	--	45.6

SOURCE: U.N. Statistical Yearbook, (New York), Various Issues.
U.S. Department of Agriculture, Agriculture Statistics, (Washington), Various Issues.

TABLE 2.6

ANNUAL TOTAL CONSUMPTION OF MAJOR CONSUMERS 1960 TO 1978
Thousands of Metric Tons

Year	BRAZIL	USA	USSR	AUSTR.	CUBA	U.K.	DOMINICAN REPUBLIC	INDIA	JAPAN	CANADA	EEC	FRANCE	WORLD TOTAL
1960	2456	8671	6269	589	339	2879	78	2269	1420	795	8592	1500	47888
1961	2667	8868	7350	555	362	2927	79	2523	1564	790	8823	1478	51508
1962	2731	9106	8200	513	374	2923	96	2503	1578	825	8991	1542	53638
1963	2771	9256	8300	580	415	2931	115	2741	1645	854	9234	1653	54871
1964	2891	9194	8325	568	429	2800	113	2595	1877	883	9281	1684	55829
1965	2897	9253	8976	663	446	2873	106	2646	1818	936	9546	1717	58606
1966	2946	9589	9402	674	517	2845	107	2958	1984	967	9770	1774	61518
1967	3116	9535	9840	678	580	2997	109	3175	2174	1030	10065	1814	63902
1968	3317	9535	10433	684	680	2845	135	2793	2360	992	9819	1585	65638
1969	3516	9716	10705	748	681	2801	137	2869	2597	1048	10387	2184	68168
1970	3540	10043	10886	660	726	2914	138	4264	2728	1043	10617	2080	71296
1971	3743	10579	9994	671	726	2967	145	4536	3130	1030	10641	2089	72995
1972	3900	10900	10100	934	500	2925	150	4448	2850	1050	10648	2150	74742
1973	4064	11179	11164	760	451	2900	140	4367	3300	1021	10875	2186	77519
1974	4101	10826	11250	823	750	2975	161	4807	3087	1099	11336	2203	80617
1975	4700	9186	11300	792	500	2789	163	4850	3141	895	10522	2151	78131
1976	5100	9880	11400	761	525	2530	176	4455	2730	1022	10230	2174	79520
1977	5060	10369	12000	785	608	2614	177	4232	3300	1112	9871	2094	84833
1978	5289	9954	12200	787	487	2689	182	5211	2886	1099	10550	2112	87934

SOURCE: International Sugar Organization, Yearbook, (London), Various Issues.
U.S., Department of Agriculture, Foreign Agriculture Circular, Sugar, Foreign Agriculture Service, FS 3-77, (Washington: August, 1977).

United States' government under the United States Sugar Act. An analysis of the United States' sugar policies and those of other major sugar traders is undertaken in Chapter III.

The next major importer of centrifugal sugar is the USSR. Imports of centrifugal sugar by the USSR increased from approximately 2 million metric tons in 1960 to about 5 million metric tons in 1978. It should be noted that these are gross import quotations which must be interpreted cautiously, since they do not take into account re-exports to member countries of the COMECON group. It is difficult to interpret the USSR's role as a net importer in the international sugar market. There are enormous difficulties associated with obtaining adequate data. As a result, estimates are often made of stocks and quantities of sugar exported. These estimates can be misleading at times.

A most noticeable feature of the USSR importation of sugar between 1960 and 1978 is the major fluctuations which have occurred. Table 2.3 demonstrates these variations. Between 1960 and 1978, imports have fluctuated between 1.9 million metric tons in 1960 and 4.8 million metric tons in 1978. As a major importer and consumer of sugar, the role of the USSR in the international trade in sugar has steadily increased. In 1960, average per capita sugar consumption was approximately 80.3 lbs; by 1978 average per capita consumption had increased to 103.2 lbs. In 1960, total consumption of sugar in the USSR was 6.2 million metric tons. This represented 12.9% of the total world consumption

University of Alberta

of centrifugal sugar. In 1978, total sugar consumption level in the USSR was 12.2 million metric tons or 13.8% of total world consumption.

Another major importer of centrifugal sugar is the United Kingdom. In 1960, imports of sugar by the United Kingdom were 2.5 million metric tons. In 1978, imports decreased to 1.8 million metric tons. With the exception of 1977 and 1978 when reported figures were 1.8 million metric tons, importation of centrifugal sugar by the United Kingdom has tended to be close to the annual average level of 2.3 million metric tons from 1960 to 1978. Traditionally, the United Kingdom was the major importer of centrifugal sugar under the now defunct Commonwealth Sugar Agreement (CSA). Since joining the EEC, this policy has been replaced by the sugar policy of the EEC.

Consumption levels of centrifugal sugar in the United Kingdom have also been relatively stable from 1960 to 1978 as is shown in Table 2.6. In 1960, total consumption of sugar in the United Kingdom was 2.8 million metric tons. This represented 5.8% of the total world sugar consumption. In 1978, the total consumption of centrifugal sugar in the United Kingdom was 2.6 million metric tons. The average annual consumption level of centrifugal sugar in the United Kingdom has been around 2.8 million metric tons. This stability was due in part to the special arrangements of the Commonwealth Sugar Agreement between the United Kingdom and Commonwealth sugar suppliers in which a fixed quantity of

University of Alberta

sugar was supplied annually at a negotiated price.

One of the facets of the role of the United Kingdom as a sugar exporter is in its export trade in sugar by-products such as confectionary, canned fruits, jams, and jellies. There is little relevant data on these transactions. The quantity of sugar used for nonfood or commercial usages is not precisely recorded. Prior to joining the EEC, the United Kingdom was (under the Commonwealth Sugar Agreement) a net exporter of sugar to such countries as Nigeria, Norway, the Netherlands, Switzerland, Tunisia, West Germany and Iraq. However, since its association with the EEC, the United Kingdom's role as an exporter has declined significantly.[1]

THE OVERALL PATTERN OF WORLD TRADE: 1960 to 1978

One of the dominant features of international trade in sugar between 1960 and 1978 was the embargo placed on Cuba's exports to the United States. As a result, the USSR emerged as the major importer of Cuban sugar. For example, in 1958 and 1959 prior to the embargo, approximately 60% of Cuban sugar exports went to the United

---

[1] I. Smith, The European Community and the World Sugar Crisis, Trade and Policy Research Centre, Staff Paper No.7, (London: November 1974).

University of Alberta

States.[1] In 1960, total Cuban sugar exports were 5.5 million metric tons; of this amount 1.9 million metric tons were exported to the United States, a decrease of approximately 25% from the 1958 level. No exports were made to the United States in 1978. In contrast, 1.5 million metric tons of sugar were exported from Cuba to the USSR in 1960 as were 4 million metric tons in 1978.

As is noted in Table 2.4, total world centrifugal sugar exports in 1960 were 17 million metric tons. In 1978, world total centrifugal sugar exports increased to 24 million metric tons. During the period from 1960 to 1970 most of the expansion in the world sugar trade was accounted for by the increased trade in sugar by the USSR. During the period from 1970 to 1978, most of the increased expansion in trade has been due to increased demand attributed to the increase in world population together with increased per capita incomes in some developing countries.[2]

One of the most striking characteristic of the international sugar market during the period from 1960 to 1978 was the course of world sugar prices. Figure 2.3 shows these price movements. In 1960, the price of sugar in the world market was 3.1 cents per pound. By 1978, the price of sugar in the world market had increased to 7.8 cents per pound. The most dramatic increase in world sugar prices took place between 1972 and 1974 when the world price of sugar

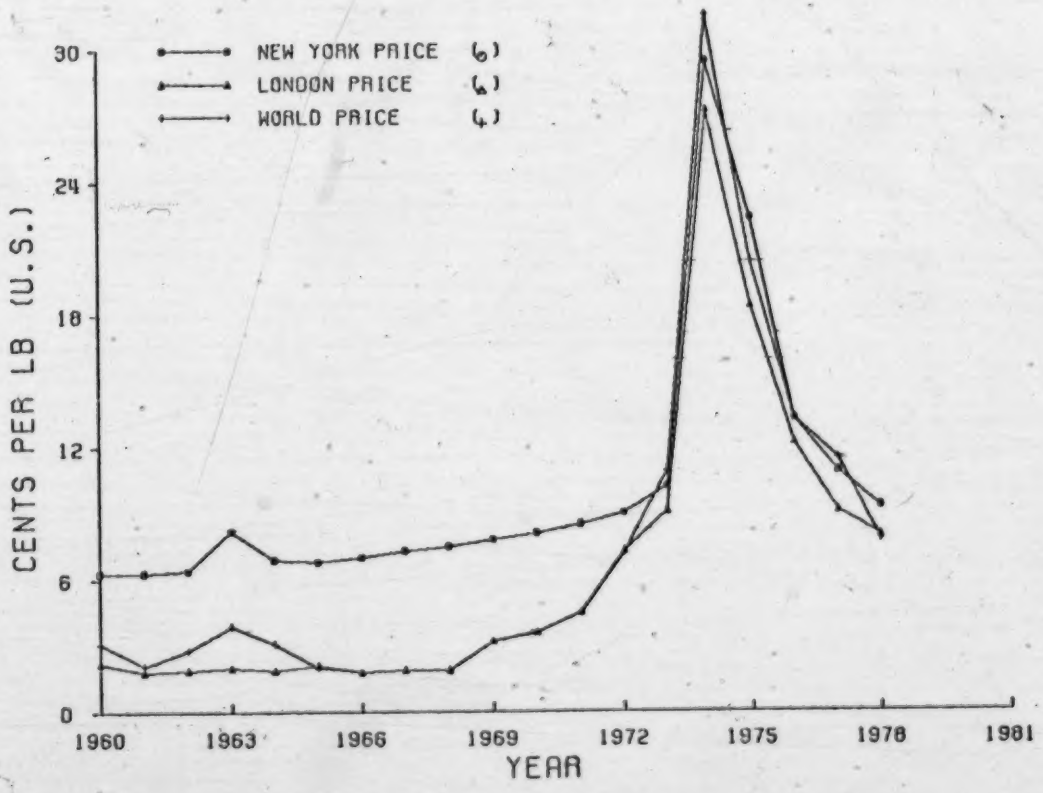
---

[1] The Commonwealth Secretariat, Plantation Crops - A Review, (London, 1964), p. 60.
[2] R. Bohall, et al., op. cit. p. 31.

University of Alberta

FIGURE 2.3

AVERAGE ANNUAL SUGAR PRICES AT SPECIFIED MARKETS
(RAW VALUE)



DATA SOURCE: (o) U.S. Department of Agriculture, Agriculture Statistics, (Washington), Various Issues.
(Δ) International Sugar Organization, Statistical Bulletin, (Rome), Various Issues.
(+) U.S. Department of Agriculture, Sugar and Sweetener Reports, Vol. 4, Nos. 5, 6, (May, Semptember 1979).

increased from 10.9 cents per pound in 1972 to 31 cents a pound in 1974.

A major underlying cause of this price instability is considered to be the changing sugar supply situation and its reflection in the volume of available supplies on the residual free market.[1] The world free market is considered to be a residual market because of the relatively smaller quantity of sugar which is traded in that market in relation to the overall level of world trade. Less than half of all the sugar traded in the international trade in sugar is traded in the world market.[2] The majority of trade in sugar is governed under special arrangements which major consuming nations have with their suppliers. Over most time period, these arrangements have fixed the price of sugar at a level higher than the world market price.

University of Alberta

---

[1] U.N., Food and Agriculture Organization, FAO Commodity Review and Outlook: 1977-79, (Rome: 1978), p. 20.
[2] Ibid.

CHAPTER III

REVIEW OF LITERATURE ON INTERNATIONAL SUGAR TRADE POLICIES

Introduction

Studies on the level and effects of protection on the international sugar industry have been relatively few in number. The majority of investigations into the international sugar trade have concentrated on the United States' sugar industry and its role in the international sugar market. Generally, most of these studies have been initiated as a result of strained diplomatic relations with Cuba, the United States' major sugar supplier prior to 1960.

Bates[1] used a spatial equilibrum analysis to estimate the long run efficiency of the United States sugar program. H.G. Johnson[2] in 1966 analysed the effects of protection in the international sugar industry on the export earnings of less developed countries. In 1969, Bates and

---

[1] T.H. Bates, "The Longrun Efficiency of the United States Sugar Policy", American Journal of Agricultural Economics, Vol. 50, No. 3, (August 1968).

[2] H.G. Johnson, "Sugar Protectionism and the Export Earnings of Less Developed Countries: Variations on a theme by R.H. Snape", Economica, Vol. 33, (1966), pp. 34-42.

University of Alberta

Schmitz[1] utilized a spatial equilibrum analysis to determine the economic efficiency of the international sugar trade. A study by Gimmell[2] was basically an extension of the work done by Bates and Schmitz, and in general, a synthesis of the above studies. Another study by Edelman and Gardiner[3] analysed the economic effects of selected trade policies in the international sugar market for 1976.

Review of Selected Literature

The two studies which influenced the development and charateristics of the present thesis will be discussed here in order to indicate both the nature of and differences in each as well as describe the characteristics of this study. Snape's study[4] was an initial empirical analysis of some of the effects of protection in the world sugar industry for the selected year of 1959. Snape estimated the extent of protection in the international sugar industry and made general inferences of the effect to which this restrained production. He also made specific estimates of the effect of

---

[1] T.H. Bates and A. Schmitz, A Spatial Equilibrum Analysis of the World Sugar Economy, University of California, Giannini Foundation Monograph No. 23, (California: May 1969).

[2] G. Gimmell, "An Equilibrium Analysis of the US Sugar Policy", American Journal of Agricultural Economics, (November 1977).

[3] M.A. Edelman and W.H. Gardiner, "The Economic Effects of Selected Trade Restrictions on the World Sugar Trade", A Paper presented to the Annual Meeting of the American Agricultural Economic Association, Washington State University, (Pullman, Washington: August 1979).

[4] R.H. Snape, "Some Effects of Protection in the World Sugar Economy", Economica, Vol. 30, (February 1963), pp. 63-73.

University of Alberta

protection on consumption levels in that year. To give an indication of the extent of protection and to derive an estimate of the effect of protection on consumption of sugar Snape compared the average prices domestic sugar producers received with world market prices in terms of "import and export parity prices". This procedure is simplistic, particularly in the implicit assumption that, allowing for refining and distribution costs, unlimited sugar supplies would be available at world free market prices. It does, however, allow comparisons of the general order of protection among countries.

In calculating average sugar prices paid to producers in different regions, Snape used estimates of refiners' gross receipts which were calculated on the basis of the quantity of sales and the average price obtained in the domestic market, protected market, and the world market in 1959. When direct subsidies were given to the producers in various regions, the degree of protection was estimated based on the average costs of raw sugar plus milling and refining costs for 1959. The second aspect of Snape's study was the estimation of the increase in consumption that would have occurred had protection been given domestic producers by means of deficiency payments or direct subsidies rather than by methods which increased price levels. These estimates were in turn based on specific estimates of the elasticity of demand for sugar. The methodology developed by Snape in his earlier study is applied in this thesis.

University of Alberta

Snape acknowledged the major deficiencies in the methodology he used. Most significantly, the assumption that world free market prices would apply in the absence of protection is suspect.

Other criticisms of his study note that agreements governing export quotas, prices and subsidies paid to domestic as well as foreign producers are continually revised. Because of the cyclical nature of the international sugar market,[1] effects of these revisions cannot be accurately measured over a period of one year. Rather, they should be measured over time in a lagged adjustment framework.[2]

Third, Snape's study did not encompass the effects of the 1960/61 trade embargo placed on Cuban sugar by the United States. This must be regarded as a major development in the international sugar industry during the last three decades. Since the United States is a major sugar consuming nation the embargo must have affected world trade patterns and foreign producers' returns. D. Gale Johnson pointed out that Snape did not measure the benefits which foreign producers were accorded due to their preferential

---

[1] R. Bohall, et al, The Sugar Industry Structure Pricing and Performance, U.S., Department of Agriculture, Economic Research Service, Agriculture Economic Report, No. 364, (Washington: March 1977), p. 33.

[2] Larry Martin and Donald MacLaren, "Market Stabilization by Deficiency Payment Program: Theoretical Analysis and its Application to the Canadian Pork Sector", Canadian Journal of Agriculture Economics, Vol. 24, No. 2, (1976).

University of Alberta

markets.[1] Snape, did however, consider this feature in a later study.[2]

In his later study; Snape examined some of the economic effects in the international trade in sugar by the removal of both national and international forms of protection for three years 1959, 1960 and 1961. Snape calculated the gains to eight sugar importing countries and their suppliers from free trade in sugar on the assumption of infinite long run elasticities of domestic supply of sugar in the importing countries. Snape considered the production of sugar in three separate processes: the production of cane and beet; the production of raw sugar; and the refining of raw sugar. In examining the effects of protection on the international trade in sugar for 1959, 1960, and 1961 Snape concluded that with the removal of protection in the international trade in sugar, net sugar imports by the eight importing nations would have increased by about 5.5 million metric tons or by 73%. The exporting countries would have had additional export earnings of about $820 million for raw sugar and $1,350 million for

University of Alberta

---

[1] D.G. Johnson, Trade in Agricultural Products, Vol. 1, A Survey of Agricultural Economic Literature, ed. L.R. Martin, 3 Vol.; University of Minnesota Press, (Minneapolis: 1977), p. 307.

[2] R.H. Snape, "Sugar: Costs of Protection and Taxation", Economica, Vol. 36, (Feburary 1969), pp. 29-41.

refined sugar.[1]

Included in the problems of data which Snape encountered are differences in currency values, taxes and import duties in the different countries. Differences in time lags between planting, harvesting and refining also contribute to data inadequacies. Even with these deficiencies, Snape's study was useful in providing a method for measuring some of the major impacts of protection in the international sugar industry.

The other study which most influenced this thesis was that of D. Gale Johnson.[2] The major objectives of Johnson's study were to evaluate the costs of the United States sugar program to domestic consumers and taxpayers, and to calculate the net benefits which domestic as well as foreign producers have received from the program. Also, he evaluated how this had affected consumption and production trends in world sugar trade.

In considering the benefits which have accrued as a result of the United States sugar program, Johnson identified the recipients of these benefits. Johnson pointed out that foreign and domestic producers were the main beneficiaries of the United States sugar program. The benefits which foreign producers received were identified as higher domestic prices obtained as a result of access to preferential markets.

---

[1] R.H. Snape, op. cit.
[2] D. Gale Johnson, The U.S. Sugar Program: Large Costs and Small Benefits, American Enterprise Institute for Public Policy Research, (Washington: 1974).

University of Alberta

Johnson noted the difficulties involved in calculating the costs of the United States sugar program to domestic consumers and to taxpayers. In overcoming some of these difficulties he estimated what he called an "upper limit" to these costs. This limit was based on the differences in export prices received by foreign traders in the world market and the domestic prices which the United States producers recieved with the necessary adjustments for tariffs, taxes, and subsidies.

A limitation of this approach as aptly pointed out by Johnson himself was the fact that the social welfare costs to the whole of the society were not calculated. Thus, the true extent of the overall cost of protection to the society were not considered. Another deficiency of Johnson's study as noted by Gimmell[1] was the fact that the supply and the demand functions used for the world sugar trade were not calculated but were "informed guesses".

Nonetheless, Johnson identified the benefits which accrued to domestic producers and concluded that:

> "The very significant decline in the number of farm workers engaged in sugar production between 1962 and 1971 indicates that the gains to farm workers, if any, must have been very small. In all domestic areas, except Florida, there has also been a

---

[1] G. Gimmell, op. cit.

University of Alberta

> significant decline in the number of farm operators engaged in the production of sugar. This implies that, if there have been substantial economic benefits from producing sugar, they have been capitalized into the value of land and not in the return to labour".[1]

Johnson advised that the policy instruments used under the United States sugar program be changed. He recommended that deficiency payments rather than production and export quotas be implemented.[2]

Economists have supported Johnson's position on the use of deficiency payments as a policy instrument for internationally traded agriculture commodities as an alternative to quotas and tariffs.[3] Nevertheless, some have cast doubts on the use and effectiveness of deficiency payments in stabilizing international markets. MacAulay[4] has argued that under certain circumstances, deficiency payments may not achieve the objective of reducing instability. Martin and MacLaren have also voiced their concern about the use of deficiency payments as a policy instrument to stabilize international commodity markets. They suggest that most of such interventions are

---

[1] D.G. Johnson, op. cit. p. 58.
[2] Ibid., p. 81.
[3] G. Gimmell, op. cit.
[4] T.G. MacAulay, "The Timing of Deficiency Payments for Stabilization", Canadian Journal of Agricultural Economics, Vol. 25, No. 1, (February 1977).

University of Alberta

aimed at support rather than at reducing stability.[1]

REVIEW OF THE THEORY OF TARIFF AND NON-TARIFF RESTRAINTS ON TRADE

As a background to the analysis of policies of the major importers and exporters of centrifugal sugar in international trade, this section outlines some of the economic effects of the major policy instruments which are utilized in international sugar markets.

Tariffs

A.M. Freeman III, in analysing the economic effects of a tariff notes:

> "Tariffs can either be specific or ad-valorem. An ad-valorem tariff is one which is expressed as a fixed percentage of the world price or unit value of the import. A specific tariff is a fixed sum per unit of

---

[1] L. Martin and D. Maclaren, op. cit.

University of Alberta

import."[1]

Eight different effects of a tariff to the importing nation in international trade are commonly cited:

1) The production effect;
2) The revenue effect;
3) The redistribution or transfer effect;
4) The consumption effect;
5) The terms of trade effect;
6) The income effect;
7) The employment effect;
8) The balance of payment effect.[2]

University of Alberta

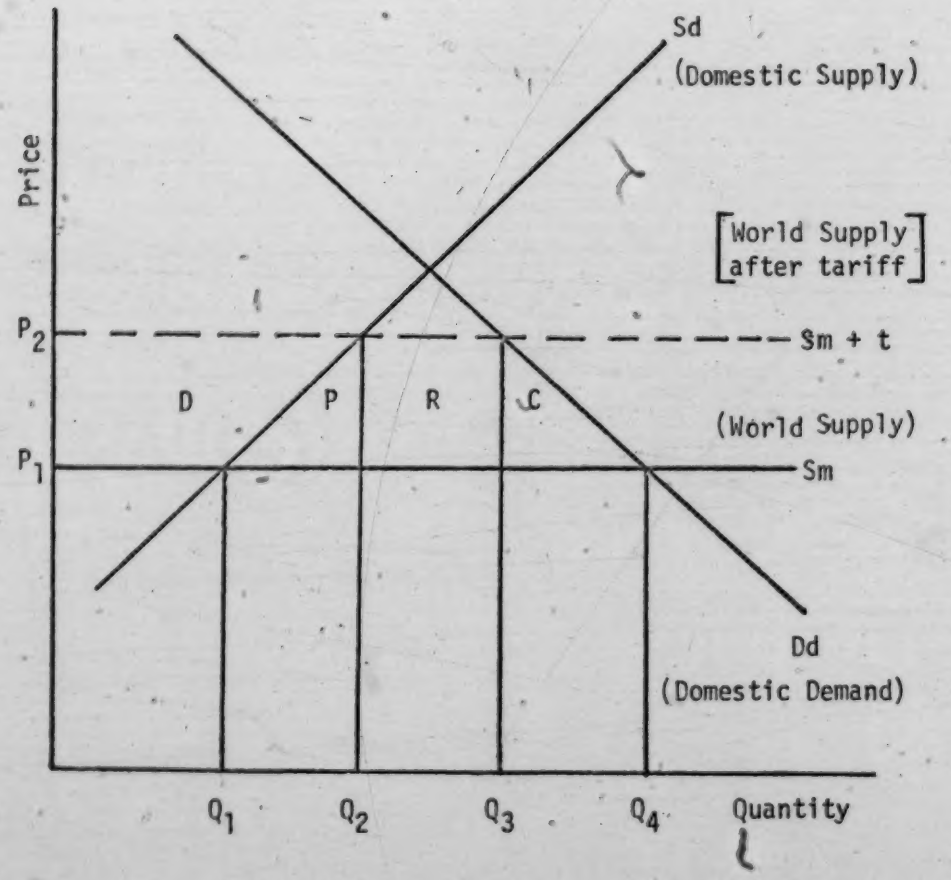
Within the framework of partial equilibrium analysis many of these effects of a tariff can be illustrated with reference to Figure 3.1. Assume that the line Dd represents domestic demand for sugar, and Sd represents domestic supply. The free trade price is assumed to be P1, and the international supply is assumed to be perfectly elastic. Based on the above assumptions, the quantity of sugar imported at price P1 is Q1Q4, the difference between

---

[1] A.M. Freeman III, International Trade: An Introduction to Methods and Theory, Harper and Row, (New York: 1971), p. 134.
[2] Ibid., p. 135.

FIGURE 3.1

Partial Equilibrium Analysis of the Effects of a Tariff for an Importing Country



SOURCE: A.M. Freeman III, International Trade: An Introduction to Methods and Theory, Harper and Row, (New York: 1971), p. 136.

domestic supply and demand. With the implementation of a tariff, domestic comsumers pay a price P2. As a result, domestic production is stimulated and increases from Q1 to Q2, domestic demand decreases from Q4 to Q3. Being residual, imports become Q2Q3. The magnitude of these changes depends on the domestic supply and demand elasticities.

One effect of the tariff is the redistribution of incomes in favour of the domestic producers of the protected product, in this case sugar. This effect is represented in Figure 3.1 as area "D". This is the additional economic rent paid to pre-existing domestic producers plus the rent paid to the new producers above their supply price. Area "D" in the diagram is rent in the economic sense, in that it is a return to the factors of production over and above that which would be required to keep them in production. In Marshallian terms this amount is an addition to producers surplus obtained through subtraction from consumers surplus.

Another effect of a tariff is the production effect, and this is represented in Figure 3.1 by the increase in production from Q1 to Q2. The net loss in misallocated resources used in producing the amount Q1Q2 domestically rather than buying it internationally at price P1 is shown by area "P". The quantity Q1Q2, is determined by the elasticity of the supply curve. The production effect of a tariff, therefore, depends on factors which influence supply elasticity (such as the length of time under consideration). For example, it would be expected that the short term effect

University of Alberta

of a tariff would not involve a great deal of production distortion since the short run supply elasticity tends to be relatively low.

The revenue effect is another end result of the imposition of a tariff, and is represented by the area "R" in Figure 3.1. This effect is the increase in price times the remaining quantity of imports. It represents the revenues accruing to the government through the collection of tariff duties on imports. The consumption effect is another product of the tariff, and is shown in the reduction in consumption from Q3 to Q2. The net loss in consumption is represented by the area labelled "C" in Figure 3.1.

The relative size of these effects is dependent on the elasticity and the position of the supply and demand functions, and upon the price involved. In addition to the effects described, tariffs and other trade restrictions influence a country's level of national income, its balance of payments, and its terms of trade. These areas of influence will not be discussed in any detail here, however, it is acknowledged that in a comprehensive study on tariffs these should be discussed in greater detail.

University of Alberta

Non-Tariff Measures

In analysing non-tariff barriers in agricultural trade Hillman concluded that a non-tariff measure is:

> " ... any governmental device or practice other than a tariff which directly impedes the entry of imports, or the exit of exports, and which discriminates against imports or exports; that is, which does not apply with equal force on domestic production or distribution".[1]

According to Baldwin, a non-tariff policy instrument is:

> "... any measure (public or private) that causes internationally traded goods and services to be allocated in such a way as to reduce potential real world income. Potential real world income is that level attainable if resources and output are allocated in an economically efficient manner. That is where Pareto-Optimum

---

[1] J. Hillman, "Non-Tariff Barriers: Major Problems in Agriculture Trade", American Journal of Agricultural Economics, Vol. 60, No. 3, (1978), p. 491.

University of Alberta

is achieved".[1]

Non-tariff policy instruments are measures which restrict imports. They provide assistance to domestic production thereby encouraging import substitution, and provide direct assistance to exporters. There are several types of non-tariff instruments. The most commonly used is the quota. The effects are generally analogous to those of a tariff.

These effects are demonstrated in Figure 3.2. Assume in the absence of a quota that the world price is P1. The schedule Dd represents domestic demand and Sd represents domestic supply. Quantity Q1 will be produced domestically, and Q1Q4 will be imported. If a quota is implemented, imports will decrease from Q1Q4 to Q2Q3. The domestic price will increase from P1 to P2 and domestic production will increase from Q1 to Q2.

The distribution of the "revenue effect" of the quota (Qa in Figure 3.2) mainly depends on how the quota is administered. For example, if the right to import is granted on a "first come, first served basis", the foreign supplier obtaining this right could capture these benefits. If the right is auctioned, then the price could be bid up to the point where the benefits of the higher domestic price would be exhausted and, providing that the bidders do not collude to keep down the bidding, the government would obtain the benefits and the distribution of the revenue would be

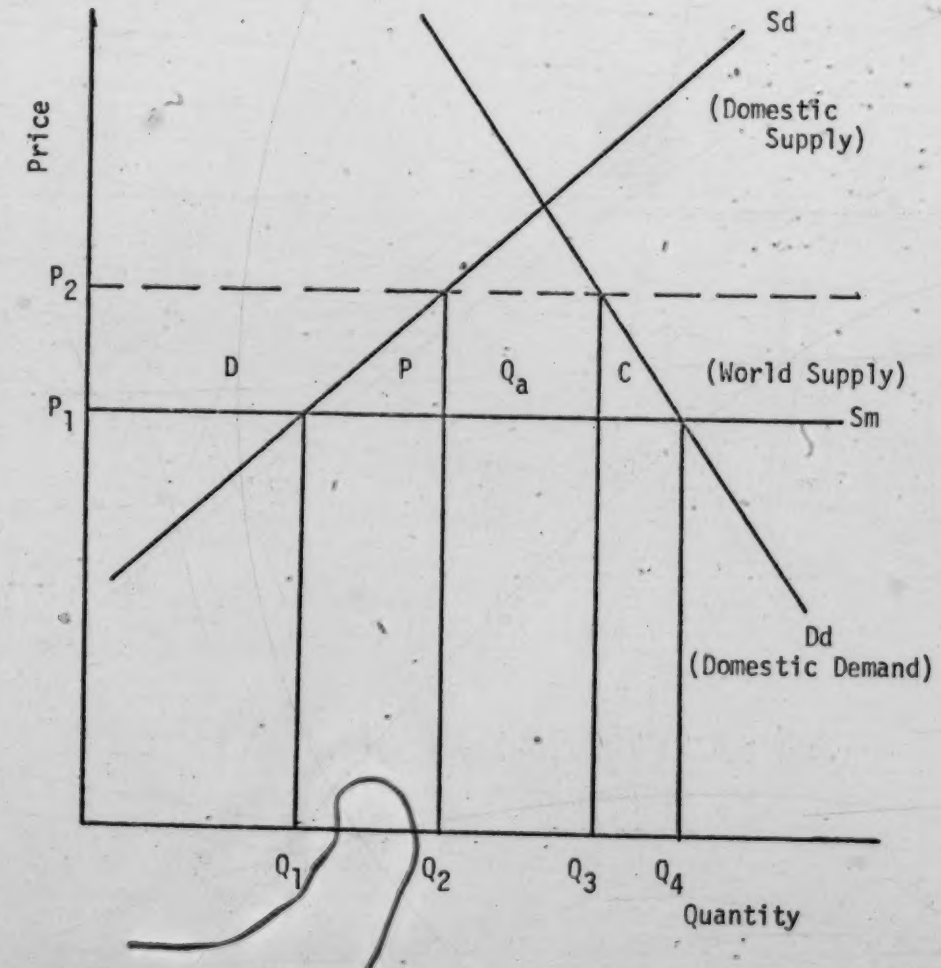
---

[1] R.E. Baldwin, Non-Tariff Distortions of International Trade, Brooking Institute, (Washington: 1970), pp. 30-108.

University of Alberta

FIGURE 3.2

Partial Equilibrium Analysis of the Effects of a Quota for an Importing Country



SOURCE: A.M. Freeman, III, International Trade: An Introduction to Methods and Theory, Harper and Row, (New York: 1971) p. 136

identical to that of a tariff.

Domestic producers become the beneficaries if they can purchase the product at the world price and sell at the higher domestic price.[1] A major difference between a quota and a tariff lies in the distribution of the revenue effect.

A Variable Levy

A variable levy can be used to encourage or discourage exports or imports of a specific commodity. The levy is different to a tariff, in that the levy is adjusted periodically in relation to domestic and world prices whereas the tariff is set at either set sum per unit or a percentage of the unit cost.[2] The amount of the levy varies so as to ensure that whatever the world price is, imports cannot be sold in the domestic market at less than the minimum import price. The overall impact is, however, similar to the trade interventions already outlined. For example, in Figure 3.3, assume that the domestic supply is represented by Sd and the domestic demand is Dd. If the world price is Pw, domestic production will be Q1 and the quantity imported will be Q1Q4. With the implementation of a variable levy, domestic price will be increased by the amount of the levy to P1. Domestic production increases from

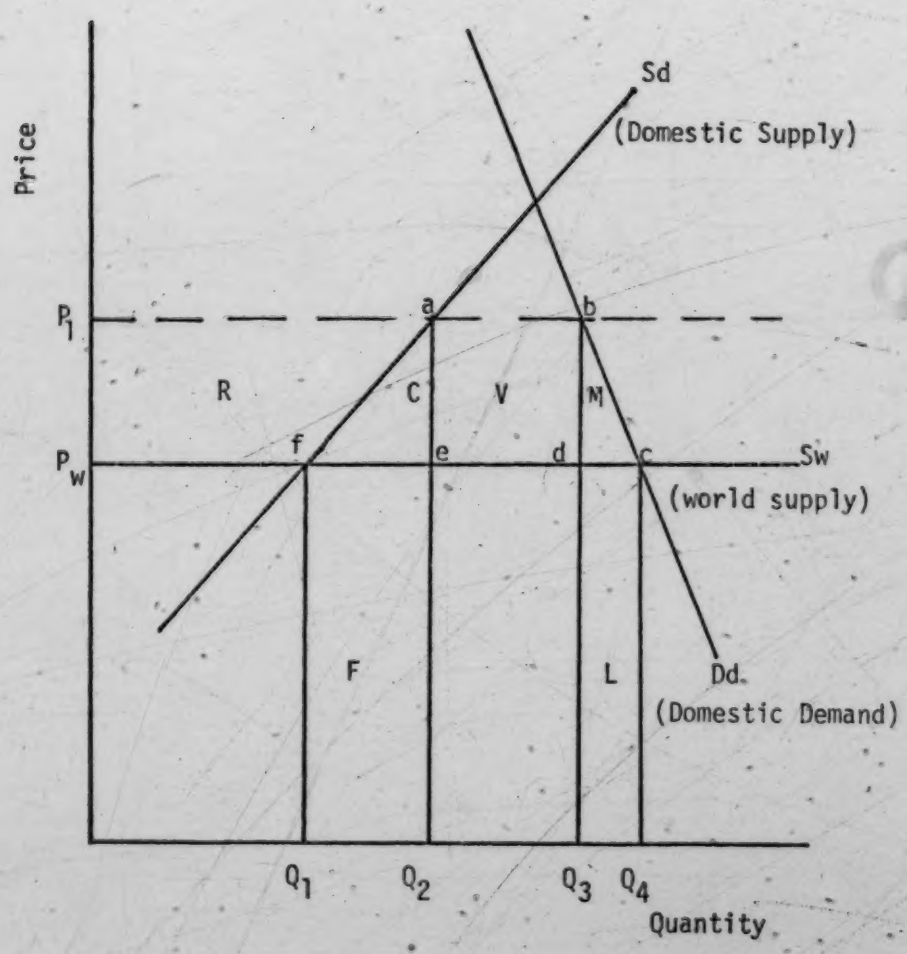
---

[1] A.M. Freeman, op. cit., p. 156.
[2] G. Hallet, The Economics of Agricultural Policy, Basil Blackwell, (Oxford: 1971), p. 195.

University of Alberta

FIGURE 3.3

The Effects of a Variable Levy
to an Importing Country



SOURCE: C. Ritson, Agriculture Economics: Principles and Policies, Crosby Lockwood Staples, (London: 1977), p. 387.

Q1 to Q2, and imports will decrease from Q1Q4 to Q2Q3. The net effect of this levy is a reduction in consumers surplus which is equal to the area PwP1bc. Extra resources used in the additional domestic production equal the areas (F+C) and producers benefit by the amount of area "R". Government revenues increases by the amount equal to area "V". The loss to consumers is (R+C+V+M), and this is greater than the sum of benefits obtained by the government and the producers (R+V) by the amount (C+M).

Deficiency Payments

Deficiency payments perform the task of guaranteeing a price to producers. They allow for unfettered trade in the market since prices are not increased to consumers above the world market price.[1] Under a program of deficiency payments the level at which price will be supported is decided in advance sometimes based on estimated production costs. The deficiency payment, then, is the difference between the average world market price and the guaranteed domestic price. This is demonstrated in Figure 3.4. Assuming that the guaranteed domestic price is P1, and Pe represents the world market price then the deficiency payment would be equal to PeP1. This increase in price influences the supply to

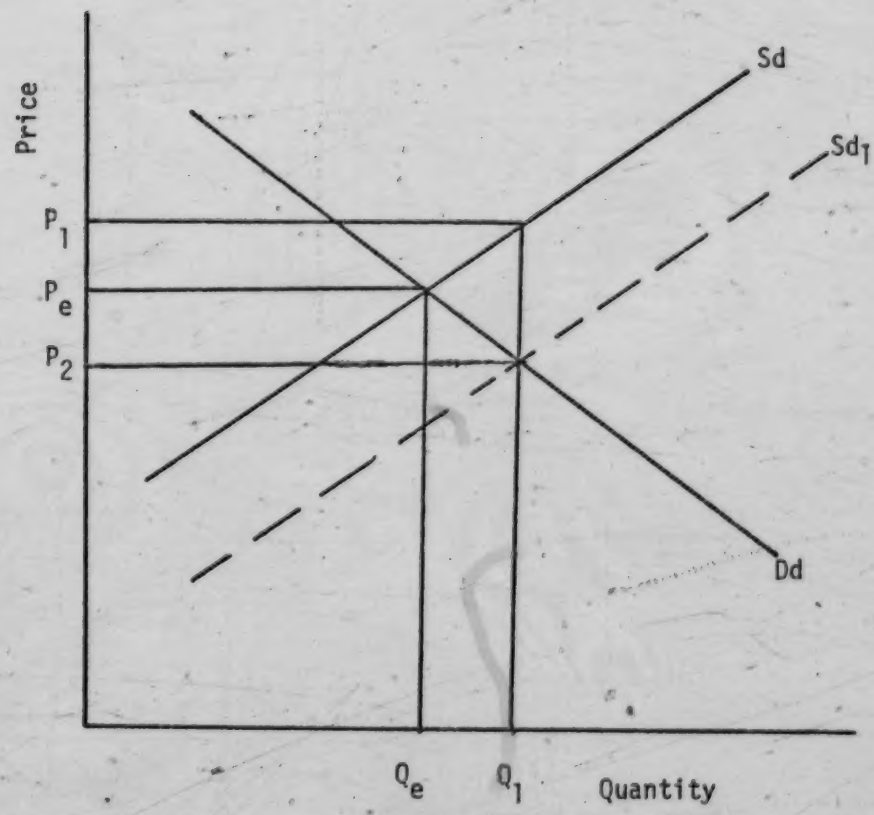
---

[1] V. L. Sorenson, International Trade Policy: Agriculture and Development, Michigan State University, (Michigan: 1975), p. 80.

University of Alberta

FIGURE 3.4

The Effects of a Deficiency Payment
in the Domestic Market



SOURCE: V.L. Sorenson, International Trade Policy: Agriculture and Development, Michigan State University, (Michigan: 1975), P.80.

increase from Qe to Q1, as new producers enter the supply function will shift outward from Sd to Sd1 making the new price to domestic consumers equal to P2.

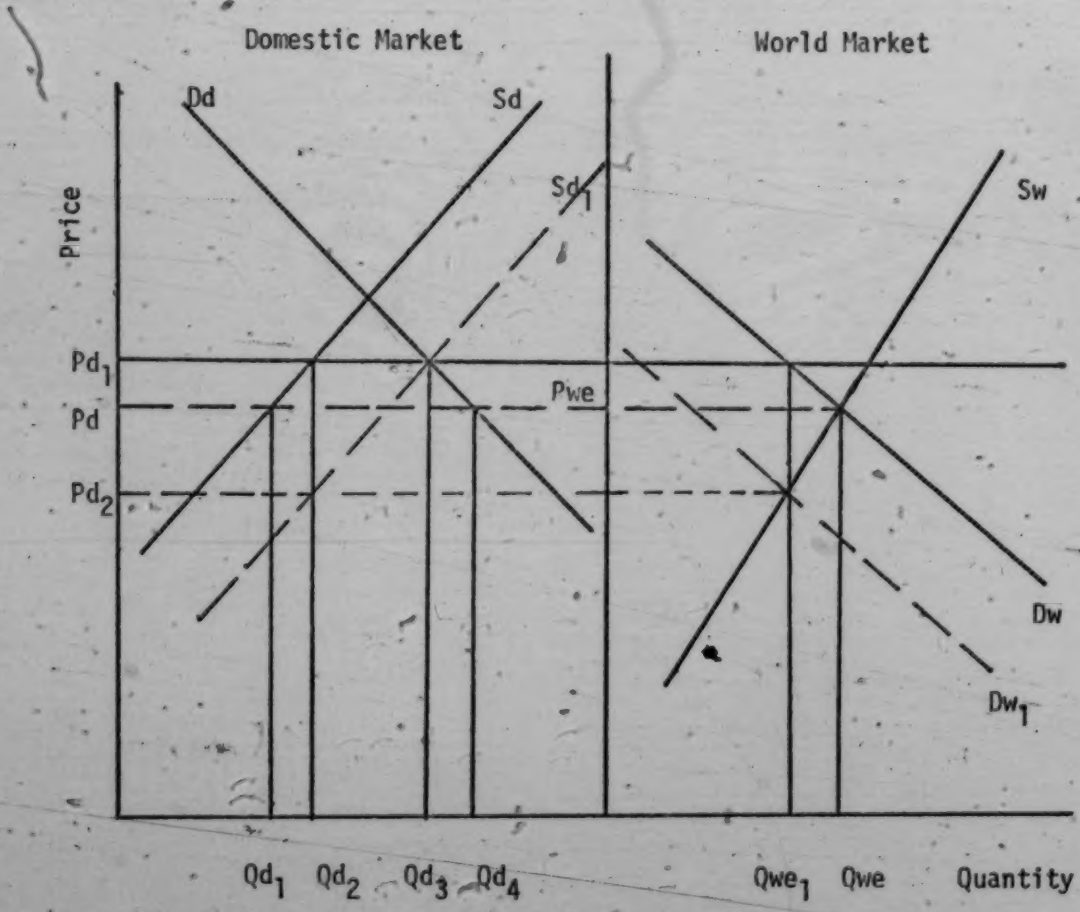
This discussion, however, does not take imports into account. Should imports be included in the analysis then the effects on world trade and domestic production and consumption will differ. Consider Figure 3.5, in which the domestic and the world markets are represented. Assume that Sd is the domestic supply function, and Dd represents the domestic demand. The world price Pwe is equivalent to the domestic price Pd. At these equilibria the quantity produced domestically would be equal to Qd1 and the quantity produced in the world market would be Qwe. The quantity imported would be Qd1Qd4 and the amount supplied by the world market would be Qwe.

With the implementation of a deficiency payment scheme the guaranteed domestic price would be equal to Pd1. This subsidization of domestic producers results in a rightward shift of the domestic supply schedule from Sd to Sd1. Quantity produced domestically would increase from Qd1 to Qd2. Imports would decrease from Qd1 Qd4 to Qd2 Qd3 thereby reducing world trade. The import demand schedule would shift to the left from Dw to Dw1, and world production from Qwe to Qwe1. Consumers in the domestic market would then pay a price of Pd2, the new world market price. The domestic producers receive the difference between the market price Pd2, and the guaranteed price Pd1.

University of Alberta

FIGURE 3.5

The Effects of a Deficiency Payment in both the World Market and the Domestic Market



SOURCE: V.L. Sorenson, International Trade Policy: Agriculture and Development, Michigan State University (Michigan: 1975), p.78.

POLICIES OF THE MAJOR SUGAR TRADERS

The United States

The Jones-Costigan Act, which later became known as the Sugar Act was implemented in 1934. D. Gale Johnson cites three major stated objectives of the United States Sugar Act at the time of its implementation:

a. That of keeping down prices for the United States consumers;

b. Maintainance of the domestic sugar production; and

c. Continued expansion of the domestic industry.[1]

Generally, the stated objectives of the United States' sugar program have been the protection of the domestic industry, and "the maintainance of adequate supplies to domestic consumers at a fair price".[2] Prior to 1934, the United States sugar industry was protected by tariff duties. These were lated changed in favour of an import and production quota scheme. This scheme was in effect up until 1974, and was operational through the use of conditional payments to domestic producers should they conform to their

---

[1] D. Gale Johnson, The U.S. Sugar Program: Large Costs and Small Benefits, op. cit., p. 9.
[2] R.H. Bohall, et al, op. cit., p. 28.

University of Alberta

production quotas.[1] The costs incurred by these payments and the administration of such a scheme were financed by a fund supported by the tariff on imported sugar.[2]

The general consensus of analysts of the United States' sugar program is that it has been grossly inefficient. D. Gale Johnson[3] estimated that the long run annual costs of maintaining the sugar program calculated from three different bases were between $502 millions and $730 millions. Johnson states in no uncertain manner:

> "Our present sugar policy has little to commend it. It involves a conflict with our general policy of trade liberalization, particularly the effort to eliminate the use of quantative restrictions - imports quotas. The costs of the program are substantially in excess of the net benefits to domestic producers and all those involved in refining sugar. The operation of our sugar program, along with similar programs of other nations, results in wild gyrations in the international market for sugar. The program maintains high-cost sugar production in the US while restricting the possibilities of expanding production where sugar

---

[1] International Sugar Organization, The World Sugar Economy: Structure and Policies, National Sugar Economies and Policies, Canada and the United States, No. 4, (London: 1979), p. 28.
[2] D.G. Johnson, op. cit. p.10.
[3] D. Gale Johnson, op. cit. p. 50.

University of Alberta

can be produced more cheaply."[1]

Bates[2] also concluded that the United States' sugar supply program was inefficient. He explored the costs of the program under different conditions. For example, with the inclusion of Cuban sugar in the United States supply with the Sugar Act in place, the estimated cost of the United States sugar supply was 38.5% greater than under a situation where there were no controls.

G. Gimmell[3] estimated that United States' consumers had paid $97 millions or 0.5¢ per pound in support of the embargo on Cuban sugar. The embargo had incurred extra transportation costs of $139 millions or 16% of overall costs. Gemmill estimated that the United States sugar program had cost a net sum of $33 millions annually or about $1.3 billions from its inception to 1974.

Jesse[4] suggested that the use of a tariff along with production quotas and subsidies put the United States at a disadvantage in obtaining supplies on the international sugar market except where special arrangements had been made and prices decided upon in advance.

---

[1] Johnson, op. cit., p. 73.
[2] T.H.Bates, op. cit.
[3] G. Gimmell, op. cit.
[4] E.V. Jesse, "US Sugar Policies: Options and Impacts", Western Journal of Agricultural Economics, Vol. 1, (June 1977), p. 233.

University of Alberta

The European Economic Community and Self-Sufficiency

In analysing the Common Agriculture Policy (CAP) of the European Economic Community (EEC), Sampson and Yeats concluded that:

> " ... CAP reduces demand for agricultural imports, imparting more inelasticity into the world demand for them. Increased inelasticity amplifies price fluctuations born by non-EEC producers."[1]

The EEC's sugar policy is governed under the auspices of the Common Agriculture Policy and is based on the concept of self sufficiency.[2] Under the sugar policy of the EEC, farmers are guaranteed a price for their produce so as "to ensure adequate returns to

---

[1] G. P. Sampson, and A.J. Yeats, "An Evaluation of the Common Agriculture Policy as a Barrier Facing Agricultural Exports to the European Economic Community", American Journal of Agricultural Economics, Vol. 59, No. 1, (Feburary 1977).

[2] Canadian Agriculture in the Seventies, A Report of the Federal Task Force on Agriculture, (Ottawa: December 1969), p. 50.

University of Alberta

producers".[1] The main objectives of the EEC's sugar policy have been stated as follows:

a. "Increased productivity in the sugar industry;
b. Stable markets in both production and prices;
c. A guaranteed sugar supply; and
d. Low and reasonable prices for EEC consumers."[2]

Three sets of policy instruments have been utilized in the EEC. They are variable levies, guaranteed prices and production quotas for domestic producers and export quotas for foreign producers.

The quotas are divided up into three classes, the "A", "B", and "C" quotas. The "A" quota is calculated based on an estimate of 95% of the community's consumption needs. The "B" quota is an additional 27.5% of the "A" quota. This quota includes a "processor's levy" which assists in financing the disposal of surplus sugar. Also, the "B" quota sugar is entitled to an export subsidy equivalent to the difference between the EEC threshold price and the world market price if the latter price is lower. "C" quota sugar is classified as sugar in excess of quotas "A" and "B" and

---

[1] European Economic Community, "The Common Agriculture Policy Serves Farmers and Consumers in a Time of Economic Instability", Common Agriculture Policy Newsletter, No. 5, (Brussels: June 1975).
[2] I. Smith, The European Community and the World Sugar Crisis, Staff Paper No. 7, Trade Policy Research Centre, (London: November 1974), p. 9.

University of Alberta

is not allowed to be sold in the community, but must be exported in its original form at the expense of the the exporter.[1]

The main feature of the EEC sugar policy is its pricing mechanism. As demonstrated in Figure 3.6, there are basically three prices for sugar in the EEC. There is the target price, the threshold price and the minimum price. These are set annually based on desired levels of production, prices, and producers' returns. The system is enforced by a mechanism of variable import and export levies. The export levies discourage the export of sugar to the world market when the price is greater than in the community. Similarly, the import levies act as a deterrent to sugar imports when community sugar prices are greater than the world price. Therefore, no sugar is imported into the community below the threshold price.[2]

The target price is the base of the EEC system. All other prices are calculated from the target price which is based on production and

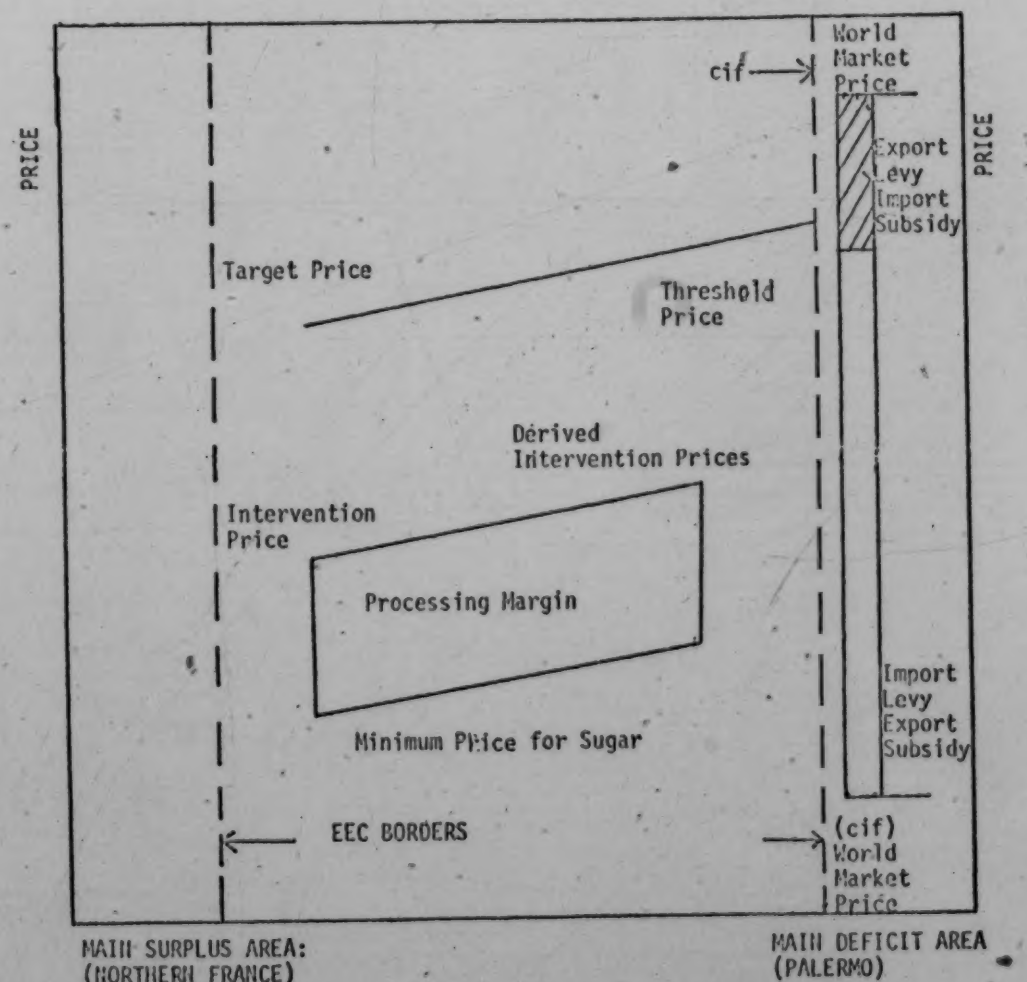
---

[1] S. Harris and I. Smith, World Sugar Markets in a State of Flux, Trade and Policy Research Centre, (London: 1973).
[2] U.S., Department of Agriculture, World Agriculture Situation, Review of 1978 and Outlook for 1979, Western Europe, Supplement 4 to WAS:18, Economic, Statistics, and Corperative Service, (Washington: May 1979).

University of Alberta

FIGURE 3.6

The European Economic Community
Sugar Price Determination Mechanism



SOURCE: U.S., Department of Agriculture, Report on World Sugar Supply and Demand 1980 and 1985, Foreign Agriculture Service, (Washington: November 1977), p. 12.

transportation costs.[1] The minimum price for sugar is derived from an intervention price minus a fixed price which reflects a standard processing margin for the community. The intervention price is a guaranteed price to producers which is calculated at 5% below the target price for the main surplus area, northern France. A slightly higher intervention price is calculated for the major non-surplus area Palermo, Italy. The threshold price equalizes the distribution of sugar within the community. It consists of the target price, plus transportation costs from the greatest surplus area to the greatest deficit area, plus the difference between the standard processing margin and the yield. Import levies are set as the difference between the threshold price and the most favourable world price.

The EEC's Common Agriculture Policy of self-sufficiency has been criticized. Smith[2] concluded that the EEC cannot ensure supplies based on the concept of self sufficiency. Domestic production is constrained by seasonal weather variations, and as such the EEC must carry surpluses to ensure a secure supply. These surpluses, Smith argued, are a burdensome waste of resources requiring expensive storage facilities. Smith suggests that the community's sugar program is ineffective and does not conform to the goals of the community's founding Treaty of Rome.

---

[1] U.S., Department of Agriculture, Report on World Sugar Supply and Demand 1980 and 1985, Foreign Agriculture Service, (Washington: November 1977), p. 9.
[2] I. Smith, op. cit.

University of Alberta

Australia, Brazil and Cuba

The production of and trade in sugar from most of the major exporting countries have traditionally been regulated to some degree.[1] Quotas and guaranteed prices based on agreements or commitments with major importers rather than price signals in the market place are major policy instruments and have tended to cover at. least some portionof production or exports. These agreements are preferred by most exporters because they insulate the exporters' revenues against downward price movements.

Some exporters have also used a system of "pooled pricing"[2] to affect domestic production and price levels. In this system, producers receive an average price for their produce. The producer's price then is the average of prices in the domestic market, the guaranteed market and the world market net of refining and marketing costs. Generally, however, the policies of sugar exporters are by and large determined by the policies of importers.

University of Alberta

---

[1] D.G. Johnson, op. cit.
[2] G. Gimmill, "An Equilibrum Analysis of US Sugar Policy", American Journal of Agricultural Economics, Vol. 59, No. 4, (November 1977).

MAJOR BILATERAL AND MULTILATERAL SUGAR AGREEMENTS

Bilateral Sugar Agreements

Bilateral sugar agreements are contractual arrangements made between two states to either purchase or to sell a specified quantity of sugar at a predetermined or "to be determined" price. These agreements basically attempt to restrict the quantity of sugar imported.[1]

Two major sets of bilateral arrangements in international trade in sugar are of concern here. These are the agreements between the United States and its major individual suppliers -- Brazil, the Philippines and the Dominican Republic The other major agreement is between Cuba and the USSR. There are other bilateral sugar arrangements,[2] but the interest shown in those mentioned above is as a result of their major role in the world trade in sugar.

---

[1] R. Senti, "Bilateral Agricultural and Commodity Agreements", Inter Economics, Verlag Weltarchive, No. 5/6, (GmbH. Hamburg: May/June 1978).
[2] Ibid.

University of Alberta

Cuba and the USSR

Before 1960, Cuban sugar was exported primarily to the United States market.[1] With the implementation of the trade embargo in 1960/61 Cuban exports have gone mainly to the USSR and Eastern European countries under special arrangements.[2]The amount of sugar traded in the agreement between Cuba and USSR is decided upon annually. Cuban shipments to the USSR ranged from 3.1 millions tons to 3.9 millions tons between 1975 and 1979. An agreement signed between the two nations offered a guaranteed price of 30¢ per pound between 1975 and 1980. The agreement also allows for a re-negotiation of the agreed price if there should be an increase in the world price above and beyond the former price.[3]

The US and Its Suppliers

Prior to 1974, the United States bilateral agreements for sugar supplies were centred around a quota system. This system has been abolished and replaced by a mechanism of subsidies and

---

[1] T.H. Bates, op. cit.
[2] International Monetary Fund, 1977 Sugar Arrangements to Seek Stability Through Buffer Stocks and Export Quotas, Research Department Survey Report, (November 21 1977).
[3] International Sugar Organization, Statistical Bulletin, Vol. 38, No 4. (April 1979).

University of Alberta

price support.[1] The quota system was arranged so that domestic producers were allocated approximately 65% of the domestic requirements and the balance was divided among foreign suppliers.[2] Johnson has outlined the methods of quota allocation which were used in the past by the United States under the sugar program.[3] In 1974, the last year of the quota program, domestic producers were allotted a total production quota of approximately 5 million metric tons. If there is a deficit in domestic sugar production, foreign suppliers' quota allocations are increased equal to the amount of the deficit based their percentage share of the United States market.[4]

With the expiration of the Sugar Act in 1974, United States' legislators have debated the issue of whether the policy of subsidies and price support which have been used since 1974 should be continued or whether a policy of deficiency payments (as recommended by Johnson) should be implemented. Added to this is the question of membership in the International Sugar Agreement. This is a crucial issue to the effective operation of the ISA since the United States is such a major trader in sugar.

---

[1] G. Gemmill, op. cit.
[2] International Sugar Organization, The World Sugar Economies: Structure and Policies; op. cit.
[3] D.G. Johnson, The US Sugar Program; op. cit., p. 12.
[4] Ibid.

University of Alberta

Multilateral Sugar Agreements

One example of this type of arrangement is the International Sugar Agreement(ISA). The first such agreement was signed in 1953 in London.[1] The objectives of the convention attempt to regulate oscillations in world sugar production, thereby reducing the effects of sugar shortages and surpluses.[2]

Multilateral sugar arrangements attempt to maintain and to moderate excessive fluctuations in the earnings of the exporters and to limit excessive increases in the cost of imports to the importer. A mechanism of export quota allocations and guaranteed prices together with a buffer stock attempts to accomplish the above mentioned objectives. The procedure of the current ISA ratified in 1979 by most major exporters and importers except for the United States is as follows:[3] At the end of each year, the International Sugar Council (ISC) will estimate market requirements and allocate export quotas based on projected consumption, stock variations, and anticipated price

University of Alberta

---

[1] U.N. Food and Agriculture Organization, Monthly Bulletin of Agricultural Economics and Statistics, Vol. 2, No. 6, (June 1953).
[2] International Monetary Fund, op. cit.
[3] International Sugar Organization, International Sugar Agreement 1977, Article No. 1. (London: 1977).

movements for the following year.[1] Figure 3.7 demonstrates the operation of the International Sugar Agreement price mechanism. Assuming that world market price for sugar declines below the guaranteed minimum price of 14 cents per pound, export quota allocations will be enforced and the special sugar stocks are constituted. Conversely, when the price rises above the agreed maximum of 19 cents per pound exports are to be increased progressively releasing the special stocks which have been constituted. This controls the supply of sugar on the market thereby affecting the price movement.[2]

An important aspect of the mechanism is the stockholding instrument. This generates additional costs to exporting member countries who are required to hold a percentage share of their quota allocation in stock.[3] This instrument attempts to regulate supplies of sugar in the world market and thus avoid excessive price fluctuations. In dealing with the problem of extra costs incurred by carrying stocks, a fund is set aside to assist exporting members.[4]

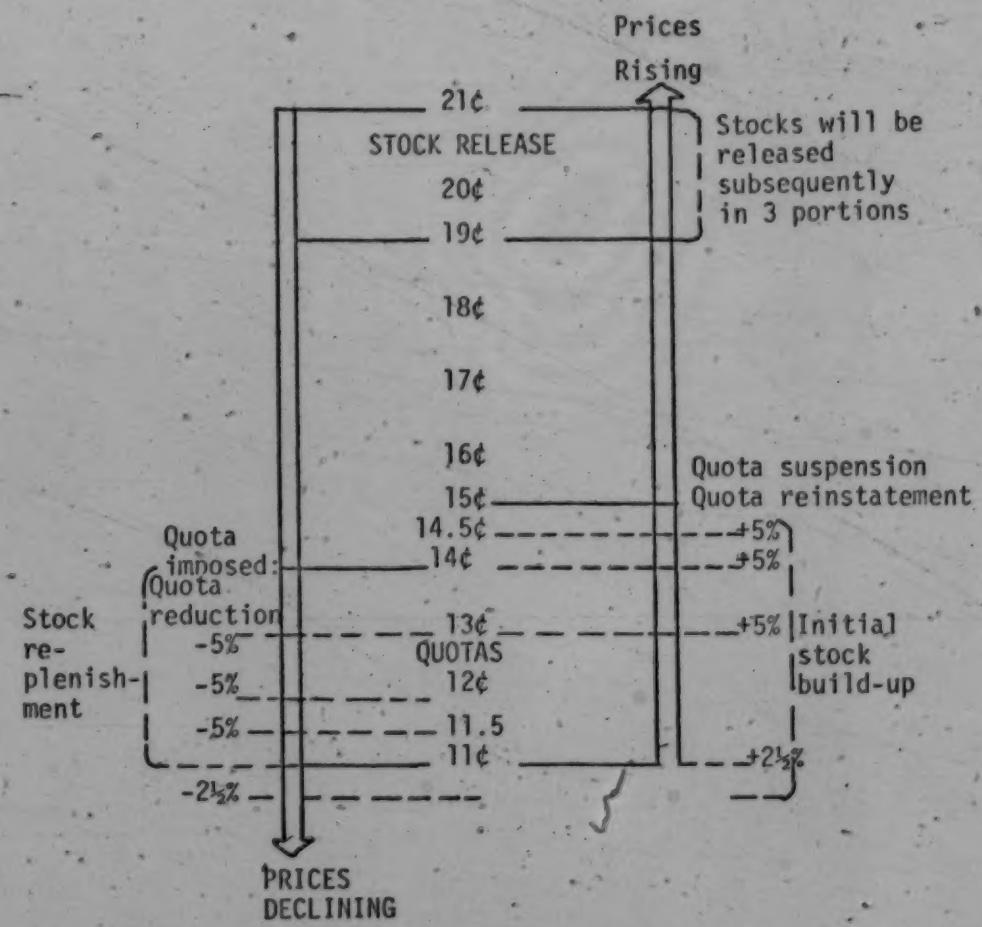
University of Alberta

---

[1] Ibid, Appendix 2.
[2] Ibid, Article 44.
[3] International Sugar Agreement, op. cit., Article 46.
[4] International Sugar Agreement, op. cit., Article 49.

FIGURE 3.7

INTERNATIONAL SUGAR AGREEMENT PRICE STABILIZATION MECHANISM



SOURCE: U.S., Department of Agriculture, Foreign Agriculture Circular, FS 1-78, (Washington: April 1978).

CHAPTER IV

THE ANALYTICAL MODEL

Introduction

Achieving precise measurement of the extent and effects of protectionism in international trade in sugar is a complex and difficult exercise. Not only should consideration be given to the impacts of protectionism on the international trade in sugar as a whole, but consideration should also be given to the effects on national economies. For example, if the domestic sugar industry is a minor employer in the national economy, the major impacts of international sugar protectionism will depend basically on the cost of domestic sugar production relative to other crops, and the price which applies on the world market. If on the other hand, the domestic sugar industry is a major employer in the national economy (as is the case in most of the major cane sugar producing countries), the major impacts of protectionism will include the effects of protection on the demand for, and the production of sugar, relative to the national income and its

University of Alberta

distribution.[1]

Studies which have attempted to measure the cost of protectionism in international trade in sugar have examined the effects of protection on resource allocation and consumption. The losses have genenally been categorized as welfare losses, that is, in terms of loss of consumer surplus and excessive production costs. These estimated losses may however, be only a small fraction of the overall national loss.[2] Magee[3] has contended that estimates of welfare losses of trade restrictions have generally been on static losses. These do not accurately estimate the total effect of protection in the international trade in sugar.

Traditionally, the measurement used has been that of nominal protection, that is, is based on the difference between import and export prices. However, questions have been raised about the accuracy of the use of nominal protection as a measure of protectionism in any given production

University of Alberta

---

[1] T.E. Josling, T. Earley, and J.S. Hillman, Agriculture Protection: Domestic Policy and International Trade, U.N., Food and Agriculture Organization, C73/LIM/9, (Rome: 1973).
[2] D.G. Johnson, "Trade in Agricultural Products", in Vol. 1, A Survey of Agricultural Economic Literature, ed. L.R. Martin, 3 Vol.; University of Minnesota Press, (Minneapolis: 1977), p. 309.
[3] S.P. Magee, "The Welfare Effects of Restriction on U.S. Trade", Brooking Papers on Economic Activity, Brooking Institute, (Washington: 1972), pp. 645-701.

activity.[1]

Grubel argues that the effective and nominal rates of protection will be identical as long as the weighted averages of protection on material inputs are the same as the protection on the final product. Effective protection however, will be greater than nominal protection if protection costs are higher than the cost of inputs or vice-versa.

In view of the complexities involved in precisely specifying and measuring international sugar protection, this study examines two of the major economic impacts of protectionism in international trade in sugar. These are the production and consumption effects of the impediments to trade in sugar imposed by major sugar importing and consuming nations.

University of Alberta

The Variables and The Data

In international trade in sugar a number of substitute commodities can be distinguished. Sugar can be classified as centrifugal sugar or non-centrifugal sugar, cane sugar or beet sugar, refined sugar or raw sugar. Price series data are available on the basis of raw sugar f.o.b. stowed in greater Caribbean ports including Brazil, as well as raw sugar c.i.f. London. The selection of variables was

---

[1] H.G. Grubel. "Nominal Tariffs, Indirect Taxes and Effective Rate of Protection", Economic Journal, Vol. 77, (December 1967), pp. 761-768.

determined to some extent by the character of the various markets for sugar. This outline of the variables used in this study includes a description of the variables, the published source, and the relevance for their inclusion in this analysis.

The World Price

The major available price series data of importance to this study are "the world price" and "the U.S. price" (New York basis). "The world price" is the price which governs trade of sugar in the "free" market. This is taken to be that established daily by the New York Coffee and Sugar Exchange. Under the estimation procedure, spot price for the day is calculated by a selected committee of brokers who are all members of the Exchange and selected annually for that purpose.[1] Using the differential between members estimated spot prices and the future price to the nearest delivery date, the spot price is estimated by first eliminating the highest and the lowest estimates of the committee members. The remaining price estimates are averaged and either added to, or subtracted from, the weighted average price for the nearest delivery month. "The world price" series data were accumulated from various

---

[1] U.S., Department of Agriculture, Sugar and Sweetner Report, Vol. 4, No. 6, (Washington: September 1979).

University of Alberta

published sources.[1]

[2]

Import and Export Parity Prices

"The import and export parity prices" are defined as "the world price" minus allowances for freight, insurance, duties, and taxes paid to the respective ports. The "import and export parity prices" used in the model for 1959 were obtained from estimates made by Snape. The "import and export parity price" estimates used for 1974 and 1978 were obtained from a U.S., Department of Agriculture study.[3]

The U.S. Price, New York basis

"The U.S. price"(New York basis), is another price which is of importance to this analysis. It is also estimated daily by the selected committee of Board members of the New York Coffee and Sugar Exchange. "The U.S. price" (New York basis), is derived by adding to "the world price", freight, and insurance charges for transporting raw sugar to New York ports, plus duties and fees. The Exchange suggests

---

[1] International Sugar Organization, Sugar Year Book, (London), Various Issues.
[2] U.S., Department of Agriculture, Sugar and Sweetner Report, Vol. 4, Nos. 5, and 6, (Washington: May, September 1979).
[3] E.V. Jesse, and G.A. Zepp, Sugar Policy Options for the United States, Economic Research Service, U.S., Department of Agriculture, Agriculture Economic Report, No. 351, (Washington: February 1977).

University of Alberta

that this price is not necessarily equivalent to the actual daily market price transacted by buyers and sellers, but serves as a general indicator of daily price movements.[1] "The U.S. price"(New York basis), data series are those published by the United States Department of Agriculture.[2]

Refining and Distribution Margin

The refining margin is defined as the cost incurred by sugar processors for converting raw sugar into refined sugar. This processing cost gives a measure of the value added to domestic or foreign produced raw sugar. Sugar is somewhat bulky, thus, transportation costs incurred in moving sugar are key considerations in the final price paid by consumers. The distribution margin then, is the cost which is incurred in transporting and distributing refined sugar. The refining and distribution margin data were accumulated from various published sources.[3] [4].

University of Alberta

---

[1] U.S., Department of Agriculture, Sugar and Sweetner Report, Vol. 4, No. 6, (Washington: September 1979).
[2] U.S., Department of Agriculture, Agricultural Statistics, (Washington), Various Issues.
[3] U.S., Department of Agriculture, Agricultural Statistics, (Washington), Various Issues.
[4] International Sugar Organization, The World Sugar Economy, Structure and Policies: Canada and United States, (London: 1979).

The Analytical Procedure

The analytical model used in this study uses Snape's initial approach[2] by estimating certain effects of protection on sugar production and consumption in some of the major consuming and producing nations for 1959, 1974, and 1978.[3]

The analysis was done in two parts. First, the general effects on prices were estimated. These were then used to estimate the consumption effects. This procedure was deemed reasonable in light of the discussion in Chapter III on the effects of trade restrictions on production, consumption, and price in both the domestic and the international market.

Where protection directly affected the price at which raw sugar was sold in the domestic market, the average gross revenues of mills and factories in the specified country were utilized as a basis for estimating the price effects. In countries where protection was given directly to the farmers through support payment schemes (as is the case in the United States), the average gross revenues of farmers

---

[1] R. Bohall, et al, The Sugar Industry's Structure, Pricing and Performance, U.S., Department of Agriculture, Agriculture Economic Report, No. 364, (Washington: November 1972).

[2] R.H. Snape, "Some Effects of Protection in the World Sugar Industry", Economica, Vol. 30, (1963).

[3] See Table 4.3, page 92 for the countries examined in this study.

University of Alberta

plus the cost of milling have been used instead of the average gross revenues of mills and factories. Data on mills and factories were obtained from estimates of their sales and prices received for raw sugar in the domestic market, preferential market, and world market.[1] The resulting estimates of average revenues were divided by total sales to give an estimate of an average weighted price received by mills and factories. This was assumed to be the average price which domestic sugar producers in the specified country received in that year. This average price was then expressed as a percentage of estimated "import and export parity prices".[2] where the latter are taken as estimates of what the average world price of raw sugar would have been in that year in the absence of any protection in the world sugar economy.

In deriving the price effects of international sugar protection in 1959 a number of alternate assumptions were made. These are as follows:

1. Three ranges of "parity prices" were used:
   a. "Import parity price" was taken as 3 3/4 cents per pound; the "export parity price" was taken as 3 cents per pound.
   b. "Import parity price" was taken as 4 1/2 cents per pound; the "export parity price" was taken as 4

---

[1] See Appendix B1.
[2] "Import and export parity prices" are defined as "the world price" minus allowances for freight, insurance, duties, and taxes to or from the respective ports.

University of Alberta

cents per pound.

c. "Import parity price" was taken as 5 1/4 cents per pound; the "export parity price" was taken as 4 3/4 cents per pound.

2. "Import parity prices" applied to net sugar importing and self-sufficient countries. "Export parity prices" applied to all net sugar exporting countries.
3. "Import parity prices" were calculated from a c.i.f. London price basis. The "export parity prices" were derived from an f.a.s. Cuban price basis.
4. "Export parity prices" were adjusted upward 1/4 cent per pound for Indonesia, Philippines and Taiwan for additional transportation costs due to their relative distance from sugar markets or potential sugar markets in relation to other exporting nations.

University of Alberta

The first "parity price" range (3 - 3 3/4 ¢/lb.) was that used by Snape.[1] The second range of "parity price" estimates (4 - 4 1/2 ¢/lb.) were suggested by Snape as alternative reasonable price estimates for raw sugar which would have existed in the absence of any protection in the world sugar economy in 1959. The third range of "parity price" estimates (4 3/4 - 5 1/4 ¢/lb.) were taken for additional comparison relative to the low range (3 - 3 3/4 ¢/lb.) and the medium range (4 - 4 1/2 ¢/lb.). The use of

---

[1] R.H. Snape, op. cit.

these alternate price assumptions gives an indication of the sensitivity of the calculated consumption estimates.

In considering the effects of protection on price levels in international trade of sugar for 1974 and 1978, the following additional assumptions were made.

1. Two "parity price" ranges were utilized, these are listed below:
   a. "Import parity price" was taken as 12 cents per pound; the "export parity price" was taken as 10 cents per pound.
   b. "Import parity price" was assumed to be 10 cents per pound; the "export parity price" was taken as 12 cents per pound.
2. The "import parity price" was estimated from c.i.f. London price basis. The "export parity price" was calculated from a f.o.b. stowed in greater Caribbean ports including Brazil price basis.

For the 1978 analysis, the following additional assumptions were made.

1. Two "parity price" estimates were taken as listed below:
   a. The "import parity price" was taken as 8.8 cents per pound; the "export parity price" was taken as 7.8 cents per pound.
   b. The "import parity price" was taken as 20 cents per pound; the "export parity price" estimate was taken

University of Alberta

as 18 cents per pound.

The "parity price" estimates used for 1974 and 1978 were obtained from a United States Department of Agriculture study.[1]

The next exercise in the analysis was to estimate the major impacts of protection on sugar consumption in the major consuming and importing nations. In estimating the major consumption effects of protectionism in the world sugar trade, following Snape, an "impost-free" retail price of sugar was estimated for the various countries in the specified year. The "impost-free" retail price was calculated by adding an estimated refining margin (which included an allowance for weight loss), and a distribution margin to the estimated parity price for the respective country and year. The difference between the estimated "impost-free" retail price and the actual retail price of sugar for the specified year and country was then expressed as a percentage of the "parity price". This percentage was then multiplied by the available estimate of the price elasticity of demand for sugar for that country. This provides estimates of the additional consumption which would have occurred in the absence of protection in the world sugar economy for the respective year.

In estimating the consumption effects, a number of assumptions have been made. These are outlined below:

---

[1] E.V. Jesse, and G.A. Zepp, Sugar Policy Options for the United States, Economic Research Service, U.S., Department of Agriculture, Agriculture Economic Report, No. 351, (Washington: February 1977).

University of Alberta

1. The price elasticities of demand used for 1959 were those used by Snape and were obtained from Viton and Pignalosa's study[1] based on time-series and cross-country analyses. Vito and Pignalosa did not calculate separate time-series correlations for all the countries included in this study due to a lack of adequate data. The price elasticities of demand used were based on 1956 prices.
2. The majority of countries specified in this study had sugar consumption levels of 200,000 metric tons or more in 1959.
3. Based on the estimated "import and export parity prices" assumed in estimating the price effects, "impost-free" retail prices were estimated for 1959. The basis for these calculations is outlined below:

   a. The refining margin was estimated at 2 1/4 cents per pound, and the distribution margin was estimated at 2 1/4 cents per pound. With an "import parity price" of 3 3/4 cents per pound, the estimated "impost-free" retail price was 8 1/2 cents per pound or 18.2 cents per kilogram. The "impost-free" retail price used was 19 cents per kilogram. Similarly, for exporting countries with a "parity price" of 3 cents per pound, the estimated "impost-free" retail price

---

[1] A. Viton, and F. Pignalosa, "Trends and Forces of World Sugar Consumption", U.N., Food and Agriculture Organization, Commodity Series Bulletin, No. 32, (Rome: 1961).

University of Alberta

used was 17 cents per kilogram when the refining and distribution margins were added.

b. Identical calculations were repeated for the other two "parity price" ranges. Estimated "impost-free" retail prices of 8 1/2 cents per pound for exporting countries and 9 cents per pound for importing countries were used for the medium range of "parity prices" (4 -4 1/2 ¢/lb.). For the upper range of estimated "parity prices" (4 3/4 - 5 1/4 ¢/lb.), an "impost-free" retail price of 9 1/4 cents per pound was estimated for exporting countries and 9 3/4 cents per pound for importers.

University of Alberta

Similar calculations were made for 1974 and 1978 to estimate the average "impost free" retail price of sugar for the specified countries. The same assumptions made for 1959 were held for 1974 and 1978 with a few exceptions. These are outlined below:

1. The price elasticities of demand used for 1974 and 1978 were obtained from

Pignalosa.[1] These price elasticities of demand were calculated based on 1975 prices.

2. For 1974, the refining margin was estimated at 4 cents per pound and the distribution margin at 4.3 cents per pound. For 1978, the refining and distribution margins were taken as 4.5 cents per pound each.

These estimates of refining and distribution margins were taken from a United States Department of Agriculture report.[2]

University of Alberta

Results of the Analysis

In estimating the effects of international sugar protection for 1959, three sets of "parity prices" were utilized. These are outlined below:

1. Under assumption (a): The "import parity price" was taken as 3 3/4 ¢/lb. The "export parity price" was taken as 3 ¢/lb.
2. Under assumption (b): The "import parity price" was taken as 4 ¢/lb. The "export parity price" was assumed to be 4 1/2 ¢/lb.

---

[1] F. Pignalosa, Ibid.
[2] R. Bohall, et al, The Sugar Industry's Structure Pricing and Performance, U.S., Department of Agriculture, Economic Research Service, Agriculture Economic Report, No. 364, (Washington: March 1977).

3. Under assumption (c): The "import parity price" was taken as 4 3/4 ¢/lb. The "export parity price" was taken as 5 1/4 ¢/lb.

The results in Table 4.1 show that the extent of protection implied by Snape's assumptions (assumptions a) was appreciably higher than is implied by the assumed export and import parity prices of alternative assumption (b). This reduction in the extent of protection (as indicated by the lower percentages which estimated average prices are of assumed export and import parity prices) was greatest in the case of Hawaii and Puerto Rico (with a 60% reduction in protection) and was the least in the case of British Honduras. The extent of protection implied in assumption (b) for West Germany and the United States was 33% less than that implied by assumptions (a). The extent of this reduction in protection was 44% for Indonesia, and 40% for each of Brazil, Barbados, and Fiji. Even further reduction in the extent of protection are involved in the price ranges of assumption (c) as Table 4.1 indicates. The reduction in protection impilied for West Germany was 86% less under assumption (c) when compared to the calculations under assumption (b). For Puerto Rico and Hawaii, the estimated average prices expressed as a percentage of export and import parity prices under assumption (c) were 75% less than under assumption (b). For the United States, this decline in

University of Alberta

TABLE 4:1

HOME PRODUCED RAW SUGAR 1959: ESTIMATED AVERAGE PRICE

CANE		ESTIMATED AVERAGE PRICE OF HOME PRODUCED RAW SUGAR (U.S. cents/lb.)	AVERAGE PRICE AS A PERCENTAGE OF IMPORT OR EXPORT PARITY PRICE (A)	(B)	(C)
Argentina	(i)	4 1/2	120	100	86
Australia	(e)	4 1/2	150	113	95
Brazil	(e)	4 3/4	160	119	100
British Guiana	(e)	4 1/2	150	113	95
British Honduras	(e)	5 1/4	140	131	111
British West Indies					
Antigua	(e)	4 1/4*	140	106	89
Barbados	(e)	5	165	125	105
Jamaica	(e)	4 1/2	150	113	95
St. Christopher - Nevis	(e)	4 3/4	160	119	100
Trinidad & Tobago	(e)	5	165	125	105
Cuba	(e)	4	135	100	84
Dominican Republic	(e)	2 3/4	90	69	58
Fiji	(e)	5	165	125	80
Hawaii	(e)	7 =	235	175	100
India	(i)	6 1/4	165	137	90
Indonesia	(e)	6	185	141	93
Mauritius	(e)	4 1/2	150	113	75
Mexico	(e)	5 1/4	175	131	83
Peru	(e)	3 1/4	110	81	75
Philippines	(e)	5 1/2	170	129	85
Puerto Rico	(e)	7 =	235	175	100
South Africa	(e)	3 3/4	125	94	78
Taiwan	(e)	3 1/4	100	76	63
U.S.A. (Cane & Beet)	(i)	7 1/2 =	200	167	90
BEET					
Belgium-Lux		5 1/2	145	122	77
France (Metro)		6	160	133	81
Germany (West)		7 3/4	205	172	94
Italy		7	185	155	90
Netherlands		5	135	111	93
U.K.		6	160	133	77

NOTES:

(e) Exporter (i) Importer

(a) Import Parity Price taken as 3 3/4 ¢/lb; Export Parity taken as 3¢ lb.
(b) Import Parity Price taken as 4 1/2 ¢/lb; Export Parity Price taken as 4¢ lb.
(c) Import Parity Price taken as 5 1/4 ¢/lb; Export Parity Price taken as 4 3/4 ¢ lb.
* Average for 1958 and 1959.
= Including Conditional Payments to Farmers.
Export Parity Prices for Indonesia, Philippines and Taiwan were adjusted upward by 1/4 ¢ lb

the extent of protection was 77% less under assumption (c) when compared to assumption (b). Peru exhibited the smallest reduction (6%).

In Table 4.1, it is apparent that sugar prices are highest in those countries where protection appears to be greatest. For example, in 1959 in the United States the estimated average retail price of sugar was 7 1/2 cents per pound. This was 200% of the estimated import parity price. In Hawaii and Puerto Rico this tendency for a high level of protection was also evident. Average prices (7 cents per pound in both countries) were 235% of estimated export parity price for each case in 1959. Germany and Italy have also exhibited high levels of protection. Average retail prices estimated as a percentage of the import parity price were 205% and 185% respectively. The estimated average price of sugar in both countries was 7 3/4 cents and 7 cents per pound respectively.

The results of the analysis for 1974 and 1978 are summarized in Table 4.2. Under assumption (a) for 1974, the estimated extent of protection was highest for West Germany, Puerto Rico, and Hawaii and the lowest for the Dominican Republic. These results indicate that the highest prices for raw sugar are paid to farmers in countries where preferential treatment is given to certain sugar exporters. An example of this is observed for the United States, West Germany, Hawaii, and Puerto Rico.

The next step in the analysis was to estimate the major

University of Alberta

TABLE 4:2

HOME PRODUCED RAW SUGAR 1974 AND 1978: ESTIMATED AVERAGE PRICE

	Estimated Average Price for Home Produced Raw Sugar (U.S. cents/lb)		Average Price as a Percentage Import or Export Parity Price			
			1974		1978	
CANE	1974	1978	(a)	(b)	(a)	(b)
Argentina	(i) 7 1/2	6 1/4	63	54	71	31
Australia	(e) 7 1/2	6 3/4	75	63	87	38
Brazil	(e) 7 3/4	6 1/2	78	65	83	36
British Guiana	(e) 7 1/2	6 3/4	75	63	87	38
British Honduras	(e) 8 1/4	6 3/4	83	69	87	38
British West Indies						
Anticua	(e) 7 1/4	7 3/4	73	60	99	43
Barbados	(e) 8	7 1/4	80	67	93	40
Jamaica	(e) 7 1/2	7 3/4	75	63	99	43
St. Christopher - Nevis	(e) 7 3/4	6 1/2	78	65	83	30
Trinidad & Tobago	(e) 8	7 1/4	80	67	93	40
Cuba	(e) 7	6	70	58	77	33
Dominican Republic	(e) 5 3/4	5	58	48	64	28
Fiji	(e) 8	7	80	67	90	39
Hawaii	(e) 10	8	100	93	103	44
India	(i) 9	7	90	75	90	39
Indonesia	(e) 9 1/4	7 1/4	93	81	93	40
Mauritius	(e) 7 1/2	6 1/4	75	63	80	35
Mexico	(e) 8 1/4	6 3/4	83	69	87	38
Peru	(e) 7 1/4	6 1/2	75	60	83	36
Philippines	(e) 8 1/2	7 3/4	85	71	99	43
Peurto Rico	(e) 10	8	100	83	103	44
South Africa	(e) 7 1/3	7 1/2	78	65	96	42
Taiwan	(e) 6 1/4	7	63	52	90	39
U.S.A. (cane & beet)	(i) 10 3/4	8 1/2	90	77	97	47
BEET						
Belgium-Lux	(i) 9 1/4	8 1/4	77	66	94	41
France	(i) 9 3/4	8	81	70	91	40
Germany	(i) 11 1/4	8 1/4	94	80	94	41
Italy	(i) 10 3/4	8 3/4	90	77	99	44
Netherlands	(i) 8 3/4	7 1/2	93	63	85	38
U.K.	(i) 9 1/4	8 3/4	77	66	98	44

NOTES:

1974: (a) Export Parity Price taken as 10¢ lb; Import Parity Price taken as 12¢ lb.
(b) Export Parity Price taken as 12¢ lb; Import Parity Price taken as 14¢ lb.

1978: (a) Export Parity Price taken as 7.8¢ lb; Import Parity Price taken as 8.8¢ lb.
(b) Export Parity Price taken as 18¢ lb; Import Parity Price taken as 20¢ lb.
(e) Exporting Countries
(i) Importing or Selfsufficient Countries

Export parity prices are adjusted 1/4¢ lb. upward for Indonesia, Philippines, and Taiwan.

consumption effects of international sugar protection in 1959, 1974, and 1978. The results of this exercise are tabulated in Tables 4.3, 4.4, and 4.5. The increased consumption estimated for 1959 under assumptions (a), (b), and (c) are shown in Table 4.3. The estimated additional sugar consumption in 1959 under assumption (b) is 18% less than the estimated additional consumption under assumption (a). Under assumption (a), the additional consumption of sugar was estimated at 7% of the actual sugar consumed in 1959 for the countries specified in the model. Under assumption (b), the additional consumption of sugar was estimated at 3% of the actual sugar consumed in 1959.

The estimated additional consumption of sugar for 1974[1] Under assumption (a), the estimated additional demand was 4 million metric tons of sugar. This represents an increase of 6% in the actual sugar consumed in 1974 for the specified countries. Under assumption (b), the estimated additional demand was 2 million metric tons of sugar. This was less than the estimated additional demand under assumption (a), however, it represents a total increase of 3% over the actual sugar consumed in 1974 for the specified countries. For those countries in Section A of Table 4.4, estimated additional demand was 1 million metric ton under assumption

---

[1] One problem with the analysis for 1974 is that the assumed prices were generally less than was the case in that abnormal year (See Table 4.4). It could be expected that in the absence of protection, price levels would have been less than prevailed, though the 1974 price assumptions of this study are likely low as are, therefore, the "additional consumption" estimates for this year.

University of Alberta

TABLE 4:3

CALCULATION OF INCREASED CONSUMPTION OF SUGAR WITH THE REMOVAL OF PROTECTION AND REVENUE DUTIES - 1959

(1)		Actual Retail Prices (U.S. cents per k.g.) (2)	Percentage Reduction to Price to Export or Import Parity (3)			Price Elasticity of Demand (4)	Percentage Increase in Quantity Demanded (5) [(3)x(4)]			Actual Consumption 1959 (000 metric tons) (6)	Estimated Additional Consumption (000 metric tons) (7) [(5)x(6)]		
			a	b	c		a	b	c		a	b	c
Section A													
Australia	(e)	20.4	17	7	-	-0.39	7	3	0	531	37	16	0
Austria	(i)	22.9	17	13	4	-0.42	7	5	2	271	19	14	5
Belgium-Lux	(e)	25.2	33	25	17	-0.27	9	7	5	289	26	20	14
Denmark	(e)	17.2	1	-	-	-0.24	0	0	0	260	0	0	0
Egypt	(i)	16.0	-	-	-	-1.08	0	0	0	330	0	0	0
France (metro)	(i)	23.7	20	16	7	-0.30	6	5	2	1518	91	76	30
W. Germany	(i)	29.5	36	32	25	-0.34	12	11	9	1706	205	188	153
India	(e)	21.7	12	8	-	-1.75	22	14	0	2297	505	322	0
Italy	(i)	40.2	53	50	45	-0.57	30	29	26	1000	300	290	260
Netherlands	(i)	25.8	26	22	15	-0.37	10	8	6	507	51	41	30
South Africa	(e)	12.8	-	-	-	-0.58	0	0	0	714	0	0	0
Sweeden	(i)	27.1	30	26	19	-0.32	10	8	6	353	35	28	21
Switzerland	(i)	20.9	9	4	-	-0.31	3	1	0	270	8	3	0
U.K.	(i)	20.5	7	2	-	-0.25	2	.5	0	2979	60	15	0
U.S.A.	(i)	25.2	25	21	13	-0.28	7	6	4	8405	588	504	336
Venezuela	(i)	26.9	29	26	18	-0.42	12	11	8	234	28	26	19
Ten Other Countries*										1224	216	179	111
TOTAL										22888	2169	1722	979
Section B													
Algeria	(i)	20.6	8	3	-	-0.60	5	2	0	219	11	4	0
Brazil	(e)	17.1	1	-	-	-0.40	0	0	0	2427	0	0	0
Canada	(i)	21.8	13	8	-	-0.30	4	2	0	816	33	16	0
Chile	(i)	18.6	-	-	-	-0.50	0	0	0	221	0	0	0
Cuba	(e)	17.5	3	-	-	-0.30	1	0	0	331	3	0	0
Iran	(i)	25.3	25	21	13	-0.80	20	17	10	466	93	79	47
Japan	(i)	38.4	51	43	43	-1.00	51	48	43	1321	674	634	568
Mexico	(e)	12.7	-	-	-	-0.40	0	0	0	979	0	0	0
Pakistan	(i)	30.6	38	35	28	-1.75	66	61	49	221	146	135	105
Peru	(i)	7.4	-	-	-	-0.60	0	0	0	261	0	0	0
Philippines	(e)	21.5	21	12	2	-0.60	13	7	1	288	37	20	2
Spain	(i)	20.2	6	1	-	-0.60	4	.6	0	508	20	3	0
Turkey	(i)	36.0	53	41	42	-0.70	37	33	29	308	114	102	89
TOTAL										8366	1131	993	814
Section C													
All other Non Planned Economies										5508	582	468	372

(e): Exporting Countries
(i): Importing Countries
* Sri Lanka (Ceylon) (i), Finland, (i) Greece, (i) Guatemala, (e) Ireland, (i) Israel, (i) Norway, Portugal (i), Peurto Rico (e), Rhodesia and Nyasaland (Malawi) (i).
(a) Export Parity taken as 3¢ lb; Import Parity taken as 3 3/4¢ lb.
(b) Export Parity taken as 4¢ lb; Import Parity taken as 4 1/2¢ lb.
(c) Export Parity taken as 4 3/4¢ lb; Import Parity taken as 5 1/4¢ lb.
Export Parity Price adjusted upward 1/4¢ for Indonesia, Taiwan, and Philippines.

TABLE 4:4

CALCULATION OF INCREASED CONSUMPTION OF SUGAR WITH THE REMOVAL OF PROTECTION AND REVENUE DUTIES - 1974

1		Actual Retail Price $ (U.S. ¢ Kg) (2)	Percentage Reduction in Price to Export or Import Parity (3)		Price Elasticity of Demand (4)	Percentage Increase in Quantity Demanded [(3)x(4)] (5)		Actual Consumption (000 Metric Tons) (6)	Estimated Additional Demand (000 Metric Tons) [(5)x(6)] (7)	
Section A			(a)	(b)		(a)	(b)		(a)	(b)
Australia	(e)	27.7	0	0	-0.04	0	0	823	0	0
Austria	(i)	30.1	0	0	-0.22	0	0	350	0	0
Belgium-Lux	(i)	38.2	0	0	-0.24	0	0	400	0	0
Denmark	(i)	35.8	0	0	-0.10	0	0	278	0	0
Egypt	(i)	38.9	0	0	-0.40	0	0	600	0	0
France (Metro)	(i)	32.6	0	0	-0.24	0	0	2203	0	0
W. Germany	(i)	34.1	0	0	-0.16	0	0	2400	0	0
India	(i)	26.1	0	0	-0.78	0	0	4807	0	0
Italy	(i)	39.0	0	0	-0.33	0	0	2011	0	0
Netherland	(i)	39.3	0	0	-0.16	0	0	875	0	0
South Africa	(e)	30.8	0	0	-0.30	0	0	955	0	0
Sweden	(i)	65.6	39	29	-0.11	4	3	384	15	11
Switzerland	(i)	96.8	60	52	-0.14	8	7	340	27	23
U.K.	(i)	38.2	0	0	-0.10	0	0	2975	0	0
U.S.A.	(i)	75.6	47	38	-0.10	5	4	10826	541	433
Venezuela	(i)	28.8	0	0	-0.50	0	0	519	0	0
Ten Other Non-Planned *								1825	961	842
TOTAL								32571	1544	1309
Section B										
Algeria	(i)							656		
Brazil	(e)	20.9	0	0	-0.23	0	0	4101	0	0
Canada	(i)	88.8	55	4	-0.13	7	6	1099	76	65
Chile	(i)	61.6	35	24	-0.22	8	5	399	31	19
Cuba	(e)							750		
Iran	(i)	50.6	20	8	-0.19	4	2	794	31	15
Japan	(i)	82.9	51	44	-0.18	9	8	3087	277	246
Mexico	(e)	23.1	0	0	-0.30	0	0	2285	0	0
Pakistan	(i)	60.9	34	23	-0.1	3	2	650	19	13
Peru	(i)	14.5	0	0	-0.32	0	0	533	0	0
Philippines	(e)	20.0	0	0	-0.28	0	0	890	0	0
Spain	(i)	43.2	7	0	-0.39	3	0	1109	33	0
Turkey	(i)	40.9	2	0	-0.25	.5	0	912	4	0
TOTAL								17265	2015	358
Section C										
Other Non-Planned Economies								12244	608	468
TOTAL ≠								62080	4167	2135

NOTES: (e) Exporting Country; (i) Importing Countries
(a) Export Parity taken as 9¢ lb; Import Parity taken as 10¢ lb.
(b) Export Parity taken as 12¢ lb; Import Parity taken as 13¢ lb.
* Sri Lanka (Ceylon) (i), Finland (i), Greece (i), Guatemala (e), Ireland (i), Israeli (i), Norway (i), Portugal (i), Puerto Rico (e), Rhodesia and Nyasaland (Malawi) (i).
≠ All world, except Eastern Europe, U.S.S.R. Yugoslavia, China, Mongolia, and North Korea.

(a) and assumption (b). This represents 3% of the actual sugar consumed by those countries specified. For those countries listed in Section B, under assumption (a), estimated additional consumption was a total of 2 million metric tons or 12% of the actual sugar consumed in 1974 by those countries specified. Under assumption (b), the estimated additional demand was 350,000 lbs. less than the estimated additional demand under assumption (a). This represents 1.76% of the actual sugar consumed by the countries specified in the model. Given the removal of protectionism in the world sugar economy in 1974, it would be expected that the price of raw sugar would have been considerably less than actually prevails because of more efficient production methods, thereby encouraging additional sugar consumption in 1974.

In Table 4.5, the results of the analysis for 1978 are given. Under assumption (a), there was an estimated additional sugar consumption of 2.8 million metric tons for 1978. This represents 4.2% of the actual sugar consumed by the countries specified in the model, and additional 3.2% of the world total sugar consumption for 1978. Under assumption (b), the estimated additional demand was 1.3 million metric tons or 1.4% of the actual sugar consumed in 1978 by the countries specified.

University of Alberta

TABLE 4:5

CALCULATION OF INCREASED CONSUMPTION OF SUGAR WITH THE REMOVAL OF PROTECTION AND REVENUE DUTIES - 1978

(1)		Actual Retail Prices (U.S. cents Per Kg) (2)	Percentage Reduction in Price to Export or Import Parity (3) (a)	(b)	Price Elasticity of Demand (4)	Percentage Increase in Quantity Demanded (5) [(3)x(4)] (a)	(b)	Actual Consumption 1978 (000 Metric Tons) (6)	Estimated Additional Consumption (000 Metric Tons) (7) [(5)x(6)] (a)	(b)
Section A										
Australia	(e)	41.8	18	0	-0.04	.7	0	786	5	0
Austria	(i)	49.0	26	5	-0.22	5	1	325	16	3
Belgium-Lux	(i)	38.5	5	0	-0.24	1	0	2887	28	0
Denmark	(i)	38.1	5	0	-0.10	.5	0	712	3	0
Egypt	(i)	44.8	19	0	-0.40	7	0	842	58	0
France (Metro)	(i)	39.0	7	0	-0.24	1	0	2374	23	0
W. Germany	(i)	38.4	5	0	-0.16	.8	0	2153	17	0
India	(i)	26.8	0	0	-0.78	0	0	463	0	0
Italy	(i)	40.2	10	0	-0.33	3	0	1784	53	0
Netherlands	(i)	39.6	8	0	-0.16	1	0	676	6	0
South Africa	(e)	35.8	5	0	-0.30	1	0	1254	12	0
Sweden	(i)	84.7	7	45	-0.11	6	4	387	23	15
Switzerland	(i)	68.6	47	32	-0.14	6	4	203	12	8
U.K.	(i)	38.7	6	0	-0.10	.6	0	2530	15	0
U.S.A.	(i)	53.0	32	12	-0.10	3	1	9736	292	97
Venezuela	(i)	40.7	11	0	-0.50	5	0	519	25	0
Ten other Non-Planned Econ*								2158	986	348
TOTAL								29789	1574	471
Section B										
Algeria	(i)									
Brazil	(e)	34.3	.5	0	-0.23	.1	-	5190	5	0
Canada	(i)	96.2	21	0	-0.13	2	0	1264	25	0
Chile	(i)	46.8	22	.4	-0.22	4	.08	415	16	0
Cuba	(e)							445		
Iran	(i)	36.7	1	0	-0.19	.19	0	1256	2	0
Japan	(i)	110.6	67	58	-0.18	12	10	2440	292	244
Mexico	(e)	26.4	0	0	-0.30	0	0	2985	0	0
Pakistan	(i)	44.4	18	0	-0.1	1	0	635	6	0
Peru	(i)	20.6	0	0	-0.32	0	0	570	0	0
Philippines	(e)	31.2	0	0	-0.78	0	0	1037	0	0
Spain	(i)	52.8	31	12	-0.39	12	4	1568	188	62
Turkey	(i)	65.5	45	29	-0.25	11	7	1247	137	87
Section C										
All other Non-Planned Economies								18740	606	348
TOTAL #								67631	2851	1215

NOTES: (e) Exporting Country; (i) Importing Country.
* Sri Lanka (Ceylon) (i), Finland (i), Greece (i), Guatemala (e), Ireland (i), Israel (i), Norway (i), Portugal (i), Peurto Rico (e), Rhodesia and Nyasaland (Malawi) (i).
(a) Export Parity Price taken as 7¢ lb; Import Parity Price equals 8¢ lb.
(b) Export Parity Price taken as 11.7¢ lb; Import Parity ewuals 12.7¢ lb.
Export Parity adjusted upward 1/4¢ for Indonesia, Taiwan, and Philippines.
All world, except Eastern Europe, U.S.S.R., Yugoslavia, China, Mongolia, and North Korea.

Some Implications of the Results

The estimated increase in world sugar consumption for 1959, 1974, and 1978 which would have occurred in the absence of any protection in the world sugar economy would have represented an increase in international sugar trade. In 1978, this would have been between 1 to 4.2%. increase in consumption would be expected to stimulate world sugar production. This estimated production expansion would involve shifts in sugar production from protected high cost sugar producing areas to lower cost sugar producers. The major world sugar exporters to the international market would have increased their supplies as a result of this increased demand.

With the removal of protection in international trade in sugar, it could be expected that the larger sugar exporting nations would obtain most of the additional benefits accruing as a result of the increase in world sugar consumption levels. As is shown in Table 2.1, in 1978 the major cane producers were Brazil, India, and Cuba. Brazil had a market share of 16.5%, India's market share was 14.8%, and Cuba's market share was 13.6%.

Using the estimated export parity price of 7 cents per pound and the additional consumption estimates taken in Table 4.5, Brazil's export sugar earnings would have increased by $323,400.00 in 1978. India's sugar export earnings would have increased by an additional $290,200.00

University of Alberta

and Cuba's sugar export earnings would have increased by $266,000.00. Together, these three largest producers would have earned an additional $879,600.00. Although these calculations are somewhat rough, nevertheless, they do give an indication of the distribution of "lost" revenues to these three sugar exporters with protection in place.

It could be expected that with such a removal of protectionism in world sugar trade, the retail price of sugar would increase above the lower range of price assumptions in this study. However, this expected increase in retail prices is not expected to greatly affect the demand and consumption of sugar.

An important factor in stabilizing producers incomes could be the change in the residual nature of the world market. Because the world sugar market is currently a small segment of international sugar trade, relatively small shifts in the demand and supply functions of sugar in the protected markets greatly affect the demand and supply functions in the world market. If the world market becomes larger it might be able to absorb the impacts of these shifts more readily.

University of Alberta

Limitations of the Study

In attempting to measure the major economic effects of protectionism in the international trade in sugar many difficulites were encountered. International trade in sugar involves many countries with different trade and production policies. These present some of the major problems in effectively measuring the impacts of protection. Included in the problems encountered in this study were the differences in national import duties and taxes, import and export quotas, and currency values. Also, differences in the methods of data collection by many producing and consuming nations affected the accuracy of the results. Because of the cyclical nature of sugar cane and sugar beet production, variations in time lag between production and consumption also contribute to data inadequacies.

Protection in the international trade in sugar does not only affects the production and consumption of sugar. Protectionism also affects the national economy of countries, especially those countries dependent the national sugar industry as a major source of foreign exchange earnings. Protection also affects national resource allocation. The effect of protection on national resource allocation bears heavily on the cost of production and consumers' welfare. Only two of the major effects of protection are examined in detail in this study. They are the price and consumption effects. In this study, 29 major

University of Alberta

importing and exporting countries were selected and examined. Although, this analysis gave a reasonable indication of some of the effects of protection in the international trade in sugar, nevertheless, it would be more useful to examine more than 29 countries and three years to obtain a more accurate measure of the major impacts of protectionism in the international trade in sugar. A study of this magnitude was not possible based on the available research resources.

University of Alberta

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From the preceeding chapters of this study, it is possible to summarize some of the major economic impacts of protectionism in international sugar trade. Protectionism in international trade in sugar involves income tranfer between domestic sugar producers, consumers, and taxpayers on the one hand, and between domestic and foreign sugar producers on the other. Such income redistributions are major consequences of protection in international sugar trade. They may, in fact, be the reason of such governmental policies.

Another major economic effect of international sugar protection is that of resource misallocation in the production of sugar. As a result of protecting higher cost domestic sugar production, low cost producers are prevented from attaining optimal output levels. A major economic effect of protection in international trade in sugar was examined in the present study. The results of the analysis were specifically applicable to 1959, 1974, and 1978. They may however, be applied to other periods which bear a similarity to the years which were examined.

University of Alberta

In amassing the conclusions which may be drawn from this study, it is desirable to make a statement concerning the comparative effectiveness of protectionism. Embargoes, quotas, and tariffs distort international trade in sugar. The implications of protectionist trade policies depend on the price relationship between markets. The concepts of "export floor" and "import ceiling" prices which are applied in the International Sugar Agreement are involved in the relationship of prices between the different markets. The "export floor" is the lowest to which the domestic price of sugar is allowed to decrease relative to the foreign price before exports are triggered. The difference between the foreign price and the domestic "export floor price" is determined by export transportation costs and foreign import restrictions. The "import ceiling" is the highest level to which the domestic price is allowed to rise relative to the foreign price before imports become profitable. Import restrictions and transportation costs determine the difference between the foreign price and the domestic "import ceiling".

The removal of trade restrictions has the effect of narrowing the range between the "import ceiling" price and the "export floor" price. Perhaps the most important benefit of the abolition of trade restrictions in the international trade in sugar would be that it would force producers to become more efficient and internationally competitive.

The many special arrangements in the international

University of Alberta

sugar industry affect the industry's efficiency. One result of concessional arrangements between major sugar exporters and importers is to restrict the size of the world free market. The small size of the free market reduces its effectiveness as a reliable source of sugar. Moreover, the free market tends to be a residual market. When the world market supplies are low, the world market price tends to increase rapidily, and when supplies are abundant the world market price tends to be depressed. Greater reliance on the world free market by major importers would enlarge the relative size of the world market and thereby make it more stable. Quotas and high concessional prices contribute to the "dumping" of excess sugar supplies in the world free market. Since sugar production is cyclical in nature and yields vary from year to year, depending on such variables as the weather, a sugar producing country may have a built-in motive to produce more than its export quota requirements. If production is lower than planned, the producing country would still have enough to fill its high priced export quota. If on the other hand, planned production is exceeded, then the export quota requirements can be filled and any loss as a result of the excess production can be treated as an insurance premium which would be paid to meet the needs of the high priced concessional market.

The quota premiums provided for in the International Sugar Agreement on concessional sugar exports also influence

University of Alberta

excessive production in the international sugar industry. In the absence of any protection in the international sugar industry producers would restrict sugar production to that quantity which will be sold to cover the additional costs incurred in its production. But in many sugar exporting countries the sugar industry is controlled by government regulations. With high levels of unemployment in many of these countries, government policy seems to encourage excessive sugar production so as to create employment as long as total production costs are covered by total revenues with export quota premiums and artifically high domestic prices. In some instances, the low returns received from exports to the free market represent a greater return than the marginal social costs especially when chronic unemployment exists.

In considering the prospects for the world sugar economy, it is difficult to escape the conclusion that there is an urgent need for a more rational and multilateral approach to the international trade in sugar. A constructive step would be the gradual phasing out of direct and indirect subsidies on sugar exports. This would contribute towards a better allocation of world resources and would be of benefit to the most efficient producers. Beyond that, an improved world marketing structure could be established through the re-negotiation of a more effective International Sugar Agreement. These adjustments should reduce the substantial instability in world prices and could at the same time take

University of Alberta

appropriate account of the particular problems of the lesser developed countries whose economies are heavily dependent on sugar.

Finally, there has been much support for a reduction of protectionism in the international sugar industry by removal of embargoes, tariffs and quotas, and replacement of these with deficiency payment schemes. However, deficiency payments generally will reduce but not remove the misallocation of resources in the production of sugar. Instead of perpetuating the protection of high cost sugar production through deficiency payment schemes, policies should be developed to reallocate these resources in more efficient uses and compensate the displaced producers.

University of Alberta

Recommendations

The original objective of this study was to investigate the major economic effects of protectionism in international trade in sugar. It is believed that to a degree this objective has been met. There are however, many unanswered questions remaining in the overall analysis of protectionism in the international sugar industry. One of these questions deals with the subject of comparative advantage and relative costs of production between developed and developing

countries.[1] Sugar producers in the developing countries should realize that their ultimate stance on the question of international sugar trade policy must be based on a clear understanding of their competitive cost position in the international sugar industry relative to those of other developed countries. While the question has not been dealt with in this study it is recognized as a vital and closely related issue.

Another area which merits some attention is that of ascertaining the required adjustments necessary for displaced sugar producers as a result of a reduction or the removal of trade restrictions in the international sugar industry. Substantial resistance to the removal or reduction of protectionist policies come about as a result of the fear of sugar producers losing employment and incomes. If these fears are removed, no doubt resistance to the removal of trade barriers would decrease.

Although some sugar producers would gain from the removal or reduction in protection in the international sugar industry undoubtedly, others would lose. It is imperative that these groups be identified and adjustment assistance programs be devised and examined to determine which ones will best meet the needs of the displaced sugar producers.

Finally, with regards to further investigation into

---

[1] H.G. Johnson, "Sugar Protectionism and the Export Earnings of Less Developed Countries: Variations on a Theme by R.H. Snape", Economica, Vol. 33, (February 1966).

University of Alberta

international trade, a number of questions remain unanswered. The present study deals with some major economic implications of protectionism in the international markets for sugar. Presently, protectionist policies allow for a high level of protection for labour extensive products and a relatively low level of protection for labour intensive products. Consideration for more study should be given by researchers to other major protected internationally traded agriculture commodities such as coffee and cocoa. These would surely be welcomed additions to international commodity trade literature.

University of Alberta

REFERENCES

BALDWIN, R.E. Non-Tariff Distortions of International Trade, Brooking Institute, (Washington: 1970).

BALLINGER, R.A. A History of Sugar Marketing, U.S., Department of Agriculture, Economic Research Service, Report No. 197. (Washington: 1971).

BARNES, A.C. The Sugar Cane, John Wiley and Sons Co. Ltd., (New York: 1974).

BATES, T.H. "The Longrun Effeciency of the United States Sugar Policy", American Journal of Agricultural Economics, Vol. 50, No. 3, (August 1968).

BATES, T.H. and SCHMITZ, A. A Spatial Equilibrum Analysis of the World Sugar Economy, University of Califonia, Giannini Foundation Monograph, No. 23, (Califonia: May 1969).

Canadian Agriculture in the Seventies, A Report of the Federal Task Force on Agriculture, (Ottawa: December 1969).

BLAU, G. International Commodity Arrangements and Policies, FAO Commodity Policy Studies, No 1, (Rome: 1964).

BOHALL, R. et al., The Sugar Industry's Structure, Pricing and Performance, U.S. Department of Agriculture, Agriculture Economic Report, No. 363, (Washington: March 1977).

University of Alberta

BRANDOW, C.E. "Policy for Commercial Agriculture, 1945-71", Vol. 1, A Survey of Agricultural Economic Literature, ed. L.R. Martin, 3 Vols.; University of Minnesota Press, (Minneapolis: 1977).

CHATURVEDI, H.S. "The Sugar Industry of India", The Sugar Journal, Vol. XIII, (London: 1951).

COMMONWEALTH SECRETARIAT, Plantation Crops - A Review, (London: 1964, 1973).

DAM, K.W. The GATT Law and International Economic Organization, University of Chicago Press, (Chicago: 1970).

DEERR, N.A. A History of Sugar, 2 Vols.; Chapman and Hall, (London: 1948).

EDELMAN, M.A. and GARDINER, W.H. "The Economic Effects of Selected Trade Restrictions on the World Sugar Trade", A paper presented to the Annual Meeting of the American Agricultural Economic Association, Washington State University, (Pullman, Washington: 1979).

E.E.C., "The Common Agricultural Policy Serves the Farmers and Consumers in a Time of Economic Instability", Common Agriculture Policy Newsletter, No. 5, (Brussels: June 1975).

FREEMAN III, A.M. International Trade: An Introduction to Methods and Theory, Harper and Row, (New York: 1971).

University of Alberta

FRENCH-DAVIS, R.M. "Export Quotas and Allocative Efficiency Under Market Instability", American Journal of Agricultural Economics, Vol. 50, No. 3, (August 1968).

GIMMELL, G. The World Sugar Economy: An Econometric Analysis of Production and Policies, Agriculture Economic Report No. 313, Department of Agriculture Economics, Michigan State University, (East Lansing, Michigan: October 1976).

GIMMELL, G. "An Equilibrum Analysis of the US Sugar Policy", American Journal of Agricultural Economics, Vol. 59, No. 4, (November 1977).

GLOBE AND MAIL, June 16, 1979.

GRUBEL, H.G. "Nominal Tariffs, Indirect Taxes and Effective Rate of Protection", Economic Journal, Vol. 77, (December 1967).

HALLET, G. The Economics of Agricultural Policy, Basil Blackwell, (Oxford: 1971).

HARRIS, S. and SMITH, I. World Sugar Markets in a State of Flux, Trade and Policy Research Centre, (London: 1973).

HILLMAN, J. "Non-Tariff Barriers: Major Problems in Agriculture Trade", American Journal of Agricultural Economics, Vol. 60, No. 3, (1978).

HORTON, D.C. "Policy Directions for the United States Sugar Program", American Journal of Agricultural Economics, Vol. 52, No. 2, (May 1970).

University of Alberta

INTERNATIONAL SUGAR ORGANIZATION, "The World Sugar Economy, Structure, and Policies - The World Picture", International Sugar Bulletin, Vol. 2, (London: 1963).

INTERNATIONAL SUGAR ORGANIZATION, International Sugar Agreement - 1977, (London: 1977).

INTERNATIONAL SUGAR ORGANIZATION, Statistical Bulletin, Vol. 38, No 4. (April 1979).

INTERNATIONAL SUGAR ORGANIZATION, Sugar Year Book, (London), Various Issues.

INTERNATIONAL MONETARY FUND, 1977 Sugar Arrangements to Seek Stability Through Buffer Stocks and Export Quotas, Research Department Survey Report, (November 21 1977).

JESSE, E.V. "US Sugar Policies: Options and Impacts", Western Journal of Agricultural Economics, Vol. 1, (June 1977).

JOHNSON, D.G. "Trade in Agricultural Products", Vol. 1, A Survey of Agricultural Economic Literature, ed. L.R. Martin, 3 Vols.; University of Minnesota Press, (Minneapolis: 1977).

JOHNSON, D.G. The Sugar Program: Large Costs and Small Benefits, American Enterprise Institute for Public Policy Research, (Washington: 1974).

JOHNSON, H.G. "Sugar Protectionism and the Export Earnings of Less Developed Countries: Variations on a Theme by R.H. Snape", Economica, Vol. 33, (February 1966).

University of Alberta

JOSLING, T.E., EARLEY, T., and HILLMAN, J.S. Agriculture Protecion: Domestic Policy and International Trade, U.N. Food and Agriculture Organization, C73/LIM/9, (Rome 1973).

KRAVIS, I.B. International Commodity Agreements to Aid and Effeciency: The Case of Coffee", Canadian Journal of Agricultural Economics, Vol. 1, No. 1, (May 1968).

MACAULAY, T.G. "The Timing of Deficiency Payments for Stabilization", Canadian Journal of Agricultural Economics, Vol. 25, No. 1, (Feburary 1977).

MAGEE, S.P. The Welfare Effects of Restrictions on U.S. Trade, Brooking Papers on Economic Activity, Brooking Institute, (Washington: 1972).

MARTIN, L. and MACLAREN, D. "Market Stabilization by Deficiency Payment Program: Theoretical Analysis and its Application to the Canadian Pork Sector", Canadian Journal of Agricultural Economics, Vol. 24, No. 2, (1976).

MUNDELL, R.A. International Economics, The Macmillian Company, (London; 1968).

OJALA, E.M. "Some Current Issues of International Commodity Policy", Journal of Agricultural Economics, (British), (January 18 1967).

University of Alberta

PIGNALOSA, F., "A Statistical Analysis of Sugar Consumption and Demand", U.N. Food and Agriculture Organization, Monthly Bulletin of Agricultural Economics and Statistics, Vol. 26, No. 12, (Rome: December 1977).

RITSON, C. Agriculture Economics Principles and Policy, Crosby Lockwood and Staples, (London: 1977).

ROBINSON, D, International Trade Policy, The Macmillan Press Ltd., (London: 1972).

SAMPSON, G.P. and YEATES A.J. "An Evaluation of the Common Agriculture Policy as a Barrier Facing Agricultural Exports to the European Economic Community", American Journal of Agricultural Economics, Vol. 59, No.1, (February 1977).

SENTI, R. "Bilateral Agricutlture and Commodity Agreements", Inter Economics, Verlag Weltarchive, No. 5/6, (GmbH. Hamburg: May/June 1978).

SNAPE, R.H. "Some Effects of Protection in the World Sugar Industry", Economica, Vol. 30, (Feburary 1963).

SNAPE, R.H. "Sugar Costs of Protection and Taxation", Economica, Vol. 36, (Feburary 1969).

SMITH, I. The European Community and the World Sugar Crisis, Trade and Policy Research Centre, Staff Paper No. 7, (London: November 1974).

University of Alberta

SORENSON, V.L: International Trade Policy: Agriculture and Development, Michigan State University, (Michigan: 1975).

SPENCER, C.C. "The World Situation and Outlook for Coffee", in Agricultural Producers and Their Markets, ed. T.K. Warley, Agustus M. Kelly, (New York: 1967).

U.N., FOOD AND AGRICULTURE ORGANIZATION, "Sugar", Commodity Series Bulletin, No. 22, (Rome: 1952).

U.N., FOOD AND AGRICULTURE ORGANIZATION, Monthly Bulletin of Agricultural Economics and Statistics, Vol. 2, No. 6, (Rome: June 1953).

U.N., FOOD AND AGRICULTURE ORGANIZATION, Monthly Bulletin of Agricultural Economics and Statistics, Vol. 26, No. 12, (December 1977).

U.N., FOOD AND AGRICULTURE ORGANIZATION, Production Year Book,(Rome), Various Issues.

U.N., FOOD AND AGRICULTURE ORGANIZATION, Trade Year Book, (Rome), Various Issues.

U.N. FOOD AND AGRICULTURE ORGANIZATION, Commodity Review and Outlook, (Rome), Various Issues.

U.N., DEPARTMENT OF ECONOMICS AND SOCIAL AFFAIRS, Statistics Year Book, Statistics Office, (New York), Various Issues.

University of Alberta

U.S., DEPARTMENT OF AGRICULTURE, Report on World Sugar Supply and Demand 1980 And 1985, Foreign Agriculture Service, (Washington: November 1977).

U.S., DEPARTMENT OF AGRICULTURE, Agriculture Statistics, (Washington), Various Issues.

U.S., DEPARTMENT OF AGRICULTURE, The Sugar and Sweetener Report, Vol. 4, No. 5, (Washington: May 1979).

U.S., DEPARTMENT OF AGRICULTURE, The Sugar and Sweetener Report, Vol. 4, No. 6, (Washington: September 1979).

U.S., DEPARTMENT OF AGRICULTURE, World Agriculture Situation, Economics, Statistics, and Cooperative Service, No. 19, (Washington: July 1979).

U.S., DEPARTMENT OF AGRICULTURE, World Agriculture Situation Review of 1978 and Outlook for 1979: Western Europe, Supplement 4 to W.A.S.: 18, Economic, Statistics, and Corperative Service, (Washington: May 1979).

U.S., DEPARTMENT OF AGRICULTURE, International Grains Agreement, Foreign Agriculture Service, M-195, (Washington: November 1967).

U.S., DEPARTMENT OF COMMERCE, Statistical Abstract of the U.S., Bureau of the Census, (Washington), Various Issues.

U.S., DEPARTMENT OF AGRICULTURE, Foreign Agriculture Circular, FS 3-78, (Washington: December 1978).

University of Alberta

U.S., DEPARTMENT OF AGRICULTURE, Foreign Agriculture Circular, FS 1-79, (Washington: May 1979).

U.S., DEPARTMENT OF AGRICULTURE, Foreign Agriculture Circular, FS 3-77, (Washington: August 1977).

VITON, A., and PIGNALOSA, F. "Trends and Forces of World Sugar Consumption", U.N., Food and Agriculture Organization, Commodity Series Bulletin, No. 32, (Rome: 1952).

WALL STREET JOURNAL, December 7, 1976.

WARLEY, T.K. "Problems in the World Trade of Agriculture Products", in Agriculture Producers and Their Markets, ed. T.K. Warley, Agustus M. Kelly, (New York: 1967).

University of Alberta

APPENDIX A1

OTHER MAJOR INTERNATIONAL COMMODITY AGREEMENTS

The International Coffee Agreement

The International Coffee Agreement (ICA) was first implemented in 1963. The objective is basically the same as that of the International Sugar Agreement; that is to moderate the economic forces between international supply and demand for coffee therby ensuring reasonable prices to consumers and adequate and stable incomes for producers.[1] There are three main features of the International Coffee Agreement which directly affects its operation:

a. Export Quotas;
b. Measures to increase consumption; and the
c. Establishment of production goals;

Annual export quotas are established by the International Coffee Council (ICC) the controlling agency in advance of the following production year. These quotas are calculated based on a world consumption estimate, production

---

[1] C.C. Spencer, The World Situation and Outlook for Coffee, Agricultural Producers and their markets, ed., T.K. Warley, Agustus M. Kelly, (New York: 1967), p. 113.

University of Alberta

costs, and anticipated future world price. The quotas are then distributed to each exporting member country based on a common percentage of their basic annual quota share. Simultaneously, quarterly quotas are fixed for each exporter with the objective of balancing supply and demand throughout the year.[1]

Previously, the ICC varied the percentage of the basic export quota based on market developments. However, this was later changed when it was recognized that the system was slow in responding to changes in the market. A semi-automatic mechanism was later adopted which allowed for adjustment of export quotas on a pro-rated basis in relation to market price changes up to a maximum of 6% of the annual export quota. Quotas are adjusted on the 20th. consecutive day of price movements in either direction in relation to the "floor or ceiling prices" set for a respective type of coffee. It should be pointed out that there are three major types of coffee in the ICA, each demanding a different price because of quality, consumer preferences, and taste.[2] In addition to the assigned quotas exporting members are allowed to seek and export to new markets. This allows exporting members to reduce surplus stocks and to encourage increased consumption in traditionally low consuming countries.

---

[1] Ibid.
[2] I.B. Kravis, International Commodity Agreements to Aid and Effeciency: The Case of Coffee", Canadian Journal of Agricultural Economics, No. 1, (May 1968), p. 297.

University of Alberta

The quota system is supported by a number of control measures. The most important of these is the Certificate of Origin and ReExport. This allows an importing member country to refuse entry of any shipment of coffee unless it is accompanied by an appropiate certificate. Commodity agreements like the ISA and the ICA which do not include all the major importing and exporting countries are liable to be undermined by lower prices from imports or exports of non-member countries. The case in point was the International Grains Agreement which encountered this problem when France subsidized grain exports to be sold under the agreed minimum price.[1] Added to this the ICC prescribe production goals in consultation with producers for individual members as well as a global requirement level. As such, producers adjust their production based on export requirements, domestic needs, and required stock.

University of Alberta

The International Grains Agreement

The last International Grains Agreement (IGA) which came into effect in 1971 and expired in 1978 was an extension of the original 1949 agreement which has seen numerous changes in respect to its economic

---

[1] Canadian Agriculture in the Seventies, Report of the Federal Task Force on Agriculture, (Ottawa: December 1969), p. 47.

provisions.[1] Since then there has been disagreement between the participants on the questions of reserve stocks and maximum and minimum price levels.[2] At the time of writing, there was no formal agreement in operation however, the International Wheat Council, the agency which oversees the working of the agreement extended the 1971 agreement for another two years. Although the economic provisions of the arrangement does not apply, the agreement allows for an exchange of trade information and continued negotiations for the completion of a formal agreement.[3]

The basic objectives of the International Grains Agreement has been to:

a. Provide assured supplies of grains;
b. Promote the expansion of international trade in grains; and to
c. Further international cooperation in achieving stability in the international grain

---

[1] G. Blau, International Commodity Arrangements and Policies, FAO Commodity Policy Studies, No.1, (Rome: 1964), p.10.
[2] U.N., Food and Agriculture Organization, Commodity Review and Outlook:1977-79, (Rome: 1978), p. 14.
[3] U.S., Department of Agriculture, World Agriculture Situation, Economics, Statistics, and Cooperative Service, No. 19, (Washington: July 1979), p. 30.

University of Alberta

market.[1]

The International Grains Agreement is divided up into two major components; The Wheat Trade Convention and the Food Aid Convention. The former, combines a price mechanism which sets maximum and minimum prices and quantities to be bought together with a reserve stock program to achieve the goals of the agreement. The agreement also spelled out procedures to be followed when prices reach the maximum and miminum ranges, and sets guidelines regarding concessional transactions. The Food Aid Convention is an arrangement between the principal exporters and importers to provide a specific quantity of grains annually to needy nations. This program is supported by the participating countries either through grants of grains or cash.[2]

ECONOMIC IMPLICATIONS OF COMMODITY AGREEMENTS

K.W. Dam describes commodity agreements as:

> "...devices to disguise massive aid transfers from consumer to producer countries and are to be considered to be inferior to overt transfers in so

---

1 U.S., Department of Agriculture, International Grains Agreement, Foreign Agriculture Service, M-195, (Washington: November 1967).
2 Ibid.

University of Alberta

far as they reduce competition and lead to a less efficient allocation of resources. Such transfers may also be preferable as a technique for accomplishing stabilization".[1]

Commodity agreements can be characterized as economic as well as political policy devices used by importers and exporters of commodities to ensure a balance between the supply and demand of the respective commodity. Its political implications surfaces as a result of the negotiation process which preceeds these agreements. These negotiations involve interests of parties of unequal economic strenghts. In most cases the strongest party tends to dominate the agreements. The main goal of most commodity arrangements has been that of controlling fluctuations in commodity prices, thus controlling producers incomes and supplies of the commodity. E.M. Ojala suggests that:

"... a basic objective of international commodity arrangements is in general to stimulate a dynamic and steady growth and ensure reasonable predictability in the real export earnings of developing countries, so as to provide them with

---

[1] K.W. Dam, The GATT Law and International Economic Organization, University of Chicago Press, (Chicago: 1970), p. 245.

University of Alberta

expanding resources for their economic and social development, while taking into account the interests of consumers in the importing countries."[1]

Although commodity agreements have generally been regarded as useful policy instruments nevertheless, there have been doubts raised as a result of the difficulties involved with their implementation and administration.[2]

For commodity agreements to achieve their objectives that is, to balance the economic forces of supply and demand, both the major exporters/producers and the importers/consumers must be party to the agreement. In the case of bilateral commodity agreements this is not a problem. However, with multilateral arrangements the problem of price undercutting becomes prevalent and dangerous to the effective operation of the scheme.

Another problem inherent in the implementation of commodity arrangements is the acceptance of quota allocations and maximum and minimum prices. There is inherent disagreement between buyers and sellers. Buyers seek to pay the lowest acceptable price for the commodity, whereas sellers demand the highest possible price. The unequal sharing of production, stocks holding and disposal

---

[1] E.M. Ojala, "Some Current Issues of International Commodity Policy", Journal of Agricultural Economics, (British), (January 18, 1967).
[2] R.A. Mundell, International Economics, The Macmillian Company, (London: 1968), p. 85.

University of Alberta

costs leads to disgruntled participants.[1]

University of Alberta

---

[1] T.K. Warley, Problems of World Trade in Agriculture Products, op. cit., p. 59.

APPENDIX B1

CALCULATION OF WEIGHTED AVERAGE PRICES

The following illustrates the methodology used in estimating the weighted average prices obtained by producers in Tables 4.1 and 4.2. The calculations are for 1970 prices.[1]

BRAZIL

MARKET	QUANTITY SOLD (1000 Metric Tons)	AVERAGE PRICE OBTAINED (US ¢/lb.)
United States	605	4.88 (f.o.b. stowed in greater Caribbean ports including Brazil)
Other Markets	470	3.75
Domestic Market	3,540	4.45 (wholesale price)
TOTAL	4,615	4.36 (weighted average)

Therefore, the weighted average price received by Brazilian sugar producers in 1970 was 4.36 ¢/lb.

---

[1] Sources for the data used in Appendix B1 are: International Sugar Organization, Sugar Year Book, (London: 1971).; also International Sugar Organization, The World Sugar Economy, Structure, and Policies: Canada and United States, (London: 1979).

University of Alberta

UNITED STATES

The c.i.f. price of raw sugar imported into the United States in 1970 was 4.88 cents per pound. Duty on imported raw sugar was 0.625 cents per pound. Also, producers receive subsidies in the form of direct payments adding about 15% to their revenues. Thus the weighted average price United States domestic sugar producers received in 1970 was 6.3 cents per pound.

University of Alberta